

# CITROËN C4 2004

«The technical information contained in this document is intended for the exclusive use of the trained personnel of the motor vehicle repair trade. In some instances, this information could concern the security and safety of the vehicle. The information is to be used by the professional vehicle repairers for whom it is intended and they alone would assume full responsibility to the exclusion of that of the manufacturer».

«The technical information appearing in this brochure is subject to updating as the characteristics of each model in the range evolve. Motor vehicle repairers are invited to contact the CITROËN network periodically for further information and to obtain any possible updates».

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***Mechanics' handbook 050 0019***



### **VERY IMPORTANT**

As the booklet is constantly re-edited, this one only covers vehicles for this particular model year.

It is therefore necessary to order a new booklet each year and RETAIN THE OLD ONES.

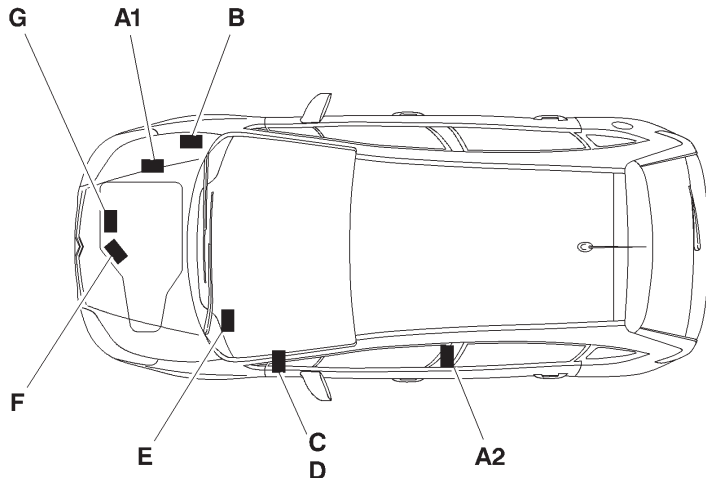
## **PRESENTATION**

**THIS HANDBOOK** summarises the specifications, adjustments, checks and special features of **the CITROEN C4**.

The handbook is divided into nine groups representing the main functions :

GENERAL - ENGINE - INJECTION - IGNITION - CLUTCH, GEARBOX, DRIVESHAFTS - AXLES,  
SUSPENSION, STEERING - BRAKES - ELECTRICAL - AIR CONDITIONING

## IDENTIFICATION OF THE VEHICLE



**A:** Manufacturer's name plate

**A1:** Front RH chassis member = All versions except **CITROËN C4 Coupé EW10J4S** (right hand drive)

**A2:** LH centre pillar = **CITROËN C4 coupé EW10J4S** (right hand drive)

**B:** Cold stamp  
(cold stamp engraved on the bodywork).

**C:** AS/RP No. and RP paint code  
(on the front pillar on driver's side).

**D:** Tyre pressures and tyre type  
(on the front pillar on driver's side).

**E:** Serial number on bodywork.

**F:** Gearbox ident. reference - Factory serial no.

**G:** Engine legislation type - Factory serial no.



## IDENTIFICATION OF THE VEHICLE

Trim level

Version

Level 1

→ X

Level 2

→ SX - VTR

Level 3

→ VTR PACK - SX PACK

Level 4

→ EXCLUSIVE - VTS

## IDENTIFICATION OF THE VEHICLE

	C4 Coupé petrol 3-door						
	ET	TU			EW		
	3	5			10		
	J4	JP4			J4		J4S
	1.4i 16V	1.6i 16V			2.0i 16V		
		AUTO.					
	Level 1-2	Level 1-2-3			Level 3-4		Level 4
Emission standard	Euro 4						
Type code	LA KFUC	LA NFUC		LA NFUF	LA RFNC		LA RFKC
Engine type	KFU	NFU			RFN		RFK
Cubic capacity (cc)	1360	1587			1997		
Fiscal rating (hp)							
Gearbox type	MAL/5	MA5/N	BE4/5	AL4	BE4/5		
Gearbox ident. plate	20 CP 42	20 CP 43	20 DM 81 (*)	20 TS 12	20 DM 71	20 DM 74 (*)	20 DM 68

(\*) = Version for outside Western Europe.

GENERAL

## IDENTIFICATION OF THE VEHICLE

	C4 Coupé diesel 3-door				
	DV			DW	
	6			10	
	ATED4		TED4	BTED4	
	1.6 16V HDi			2.0 16V HDi	
	Level 1-2-3		Level 1-2-3-4		Level 3-4
Emission standard	Euro 4		Euro 3	Euro 4	
Type code	LA 9HXC		LA 9HYB	LA 9HZC	LA RHRH
Engine type	9HX		9HY	9HZ	RHR
Cubic capacity (cc)	1560				1997
Fiscal rating (hp)					
Gearbox type	BE4/5				ML6C
Gearbox ident. plate	20 DM 75 (1)	20 DM 76 (*)	20 DM 69 (1)	20 DM 69 (2)	20 MB 01 (2)
<div>(*) = Version for outside Western Europe. (1) = Without FAP (particle filter). (2) = With FAP (particle filter).</div>					

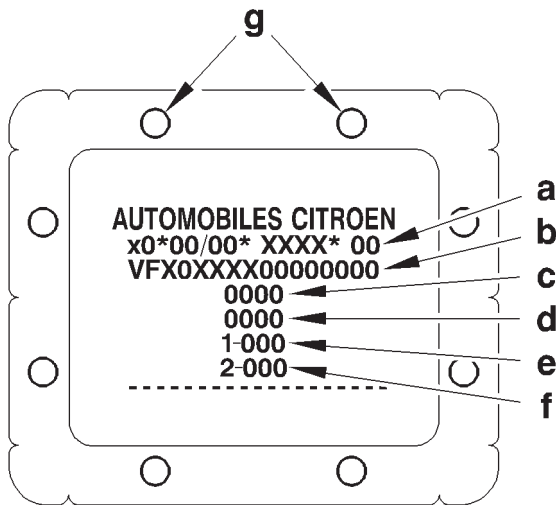
IDENTIFICATION OF THE VEHICLE							
	C4 petrol 5-door						
	ET	TU			EW		
	3	5			10		
	J4	JP4			J4	A	
	1.4i 16V	1.6i 16V		AUTO.	2.0i 16V		AUTO.
	Level 1-2	Level 1-2-3-4		Level 2-3-4	Level 2-3-4		
Emission standard	Euro 4						
Type code	LC KFUC	LC NFUC		LC NFUF	LC RFNC		LC RFJF
Engine type	KFU	NFU			RFN		RFJ
Cubic capacity (cc)	1360	1587			1997		
Fiscal rating (hp)							
Gearbox type	MAL/5	MA5/N	BE4/5	AL4	BE4/5		AL4
Gearbox ident. plate	20 CP 42	20 CP 43	20 DM 81 (*)	20 TS 12	20 DM 71	20 DM 74 (*)	20 TS 11
(*) = Version for outside Western Europe.							

## IDENTIFICATION OF THE VEHICLE

	C4 diesel 5-door			
	DV			DW
	6			10
	ATED4		TED4	BTED4
	1.6 16V HDi			2.0 16V HDi
Emission standard	Euro 4		Euro 3	Euro 4
Type code	LC 9HXC		LC 9HYB	LC 9HZC
Engine type	9HX		9HY	9HZ
Cubic capacity (cc)	1560			1997
Fiscal rating (hp)				
Gearbox type	BE4/5R			ML6C
Gearbox ident. plate	20 DM 75 (1)	20 DM 76 (*)	20 DM 69 (1)	20 DM 69 (2)
(*) = Version for outside Western Europe. (1) = Without FAP ( <i>particle filter</i> ). (2) = With FAP ( <i>particle filter</i> ).				

## IDENTIFICATION OF THE VEHICLE

### Manufacturer's plate



The manufacturer's plate carries the following information:

- (a) Type approval number (\*)
- (b) Type serial number (VIN)
- (c) Gross vehicle weight (\*)
- (d) Gross vehicle weight (\*)
- (e) Maximum weight on front axle (\*)
- (f) Maximum weight on rear axle (\*)
- (g) Manufacturer identification

(\*) = according to marketing country.

# IDENTIFICATION OF THE VEHICLE

## Structure

(1) (2) (3) (4) / (5)

Family (1)

L

CITROËN C4

Body shape (2)

A

3-door saloon

C

5-door saloons

Engine (3)

KFU

1360

ET3J4

NFU

1587

TU5JP4

RFN

1997

EW10J4

RFJ

EW10A

RFK

EW10J4S

9HX

1560

DV6ATED4 without FAP

9HY

DV6TED4 without FAP

9HZ

DV6TED4 with FAP

RHR

1997

DW10BTED4 with FAP

Variants (5)

IF

Fiscal incentives

T

Entreprise capable of conversion

P

Piloted gearbox

Version  
(Gearbox  
and emission  
standard)  
(4)

B

5-speed  
gearbox

E3

C

E4

E

4-speed  
gearbox

E3

F

E4

G

6-speed  
gearbox

E3

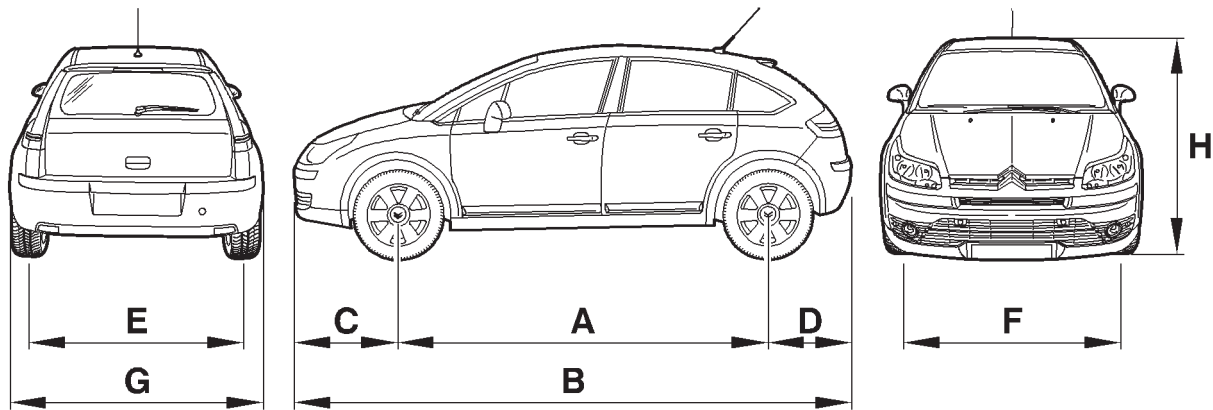
H

E4

Example : LC KFUC/IF

GENERAL

## GENERAL SPECIFICATION: DIMENSIONS



GENERAL



## GENERAL SPECIFICATION: DIMENSIONS

### Exterior dimensions (mm)

Vehicles		3-door saloons	5-door saloons
Wheelbase	A	2608	
Length overall	B	4273	4260
Front overhang	C	730	717
Rear overhang	D	935	
Rear track at ground level	E	1510	
Front track at ground level	F	1505	
Width overall	G	1769	1773
Height overall *	H	1456 à 1471 (depending on tyres)	
Height with roof bars			

\* = Vehicle in running order (vehicle empty, levels topped up).

### Interior dimensions and volumes (mm)

Vehicles		3-door saloons	5-door saloons
Elbow width, front		1440	
Elbow width, rear		1420	
Height of boot below parcel shelf (between boot carpet and parcel shelf)		492	513
Minimum floor width		1040	
Volume of boot below parcel shelf (dm <sup>3</sup> )		385	390

(\*) = Boot floor with adjustable configuration.

## GENERAL SPECIFICATION: WEIGHTS

	Petrol 3-door					Diesel 3-door			
	1.4i 16V	1.6i 16V		2.0i 16V		1.6 16V HDi			2.0 16V HDi
Engine type	KFU	NFU		RFN	RFK	9HX	9HY	9HZ	RHR
Gearbox type	MA/5		AL4	BE4/5					ML6C
Payload	520	532	520	456	431	520	521	520	456
Weight empty in running order	1181	1200	1278	1279	1337	1255	1269	1279	1379
Gross Vehicle weight	1701	1720	1798	1735	1768	1775	1790	1799	1835
Gross Train weight	2901	2920	2998	3035	2868	3075	3090	3099	3335
Max. trailer weight without brakes	628	637	628	677	686	665	672	677	727
Max. trailer weight with brakes									
Incline 12%	1200			1300	1100	1300			1500
Incline 10%					1500				
Incline 8%	1500	1400	1500		1800				
Maximum nose weight (*)	63	61	63	65	57	66			73
Maximum weight on roof bars (*)	75								

(\*) Maximum nose weight = Vertical load at the towbar.

GENERAL

## GENERAL SPECIFICATION: WEIGHTS

GENERAL

	Petrol 5-door					Diesel 5-door			
	1.4i 16V	1.6i 16V		2.0i 16V		1.6 16V HDi			2.0 16V HDi
Engine type	KFU	NFU		RFN	RFJ	9HX	9HY	9HZ	RHR
Gearbox type	MA/5		AL4	BE4/5	AL4	BE4/5			ML6C
Payload	520	532	520				530	520	468
Weight empty in running order	1182	1200	1274	1262	1292	1257	1270	1280	1381
Gross Vehicle weight	1702	1732	1794	1782	1812	1777	1800		1849
Gross Train weight	2902	2932	2994	3082	3112	3077	3110		3349
Max. trailer weight without brakes	628	637	674	668	683	666	672	677	728
Max. trailer weight with brakes									
Incline 12%	1200			1300					1500
Incline 10%									
Incline 8%	1500	1400		1500		1300			1900
Maximum nose weight (*)	63	61	62	66					73
Maximum weight on roof bars (*)	75								

(\*) Maximum nose weight = Vertical load at the towbar.

## OPERATIONS TO BE CARRIED OUT AFTER A REPAIR

**IMPERATIVE:** All these operations are to be performed following a reconnection of the battery.

### Antiscanning function.

It is necessary to wait **1 minute** after the battery has been disconnected in order to be able to start the vehicle.

### Electric windows.

It may be necessary to re-initialise the sequential and anti-pinch functions.

**NOTE:** If the window is open at the time the battery is reconnected, action the window switch several times to close it, then re-initialise.

Open the window fully.

Action and release the window switch until the window is completely closed.

**NOTE:** This operation has to be carried out on each electric window.

### Multifunction screen.

It is necessary to adjust the date, time and outside temperature.

Reconfigure the personalisation menu of the multifunction screen.

### Radio.

Reprogramme the radio stations.

### Telematic control unit (RT3 radiotelephone).

Reprogramme the radio stations.

### Navigation.

**Warning:** the vehicle has to be out in the open (*when you switch on the ignition, the navigation ECU searches for satellites*).

Reprogramme the customer parameters.

## GENERAL SPECIFICATION: TOWING THE VEHICLE

### Vehicle towing: Precautions to be taken

#### Manual gearbox

**ESSENTIAL:** Never tow the vehicles with wheels hanging  
(*towing by the wheels*).

#### AL4 automatic gearbox

**ESSENTIAL:** Never tow the vehicles with wheels hanging  
(*towing by the wheels*).

**AL4 autoactive gearbox.**

#### Towing.

If it not possible to lift the front of the vehicle:

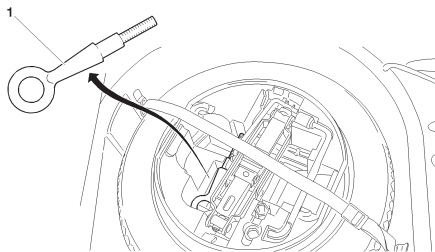
- It is imperative to place the selection lever in position «N».
- Do not add any oil.
- Do not exceed a speed of **50 km/h** (*30 mph*) over a distance of **50 km** (*30 miles*).

#### Driving.

- Never drive with the ignition switched off.
- Never push the vehicle to try to start it.

**NOTE:** The automatic gearbox is only lubricated when the engine is running.

## GENERAL SPECIFICATION: TOWING THE VEHICLE



E2AP021D

**WARNING:** When the engine is not running, steering and braking are no longer power-assisted.

### Towing eye.

#### (1) Towing eye.

The towing eye is stowed in the jack protection box in the spare wheel.

### Towing.

Vehicles with manual and automatic gearboxes.

**IMPERATIVE:** Never tow the vehicles with wheels hanging (*towing by the wheels*).

### Towing.

If it not possible to lift the front of the vehicle:

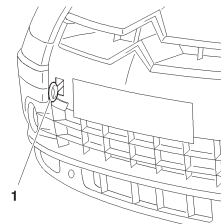
- It is imperative to place the selection lever in position «N».
- Do not add any oil.
- Do not exceed a speed of **50 km/h (30 mph)** over a distance of **50 km (30 miles)**.

### Driving.

- Never drive with the ignition switched off.
- Never push the vehicle to try to start it.

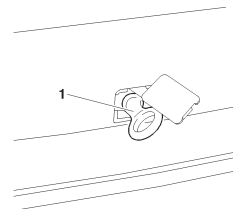
**NOTE:** The automatic gearbox is only lubricated when the engine is running.

### Front towing



E2AP02EC

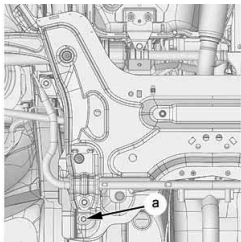
### Rear towing



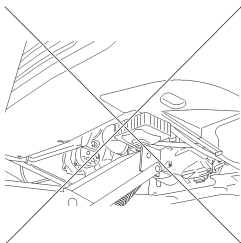
E2AP01JC

## GENERAL SPECIFICATION: LIFTING AND SUPPORTING THE VEHICLE

### Front lifting



C4AP1GWC



E2AP016C

### Lifting and supporting the vehicle

#### Front of the vehicle.

The authorised lifting points at the front of the vehicle are on the rear fixing bolts of the subframe at «a».

For front lifting, take weight at the two lifting points at «a», using a crossbeam equipped with blocks.

For front lifting from the side, take weight at the lifting point at «a».

**ESSENTIAL: Never attempt to lift by the front panel mountings.**

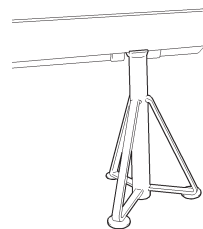
#### Side lifting.

**Always ensure the jack is correctly positioned at the lifting points.**

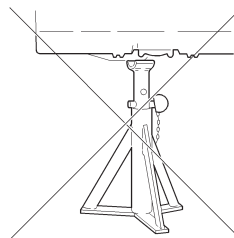
**Do not place the axle stands under the jack contact lugs.**

Positioning of the axle stand.

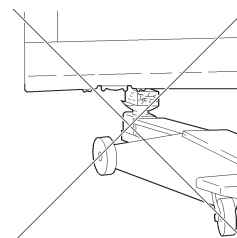
### Side lifting



E2AP00GC



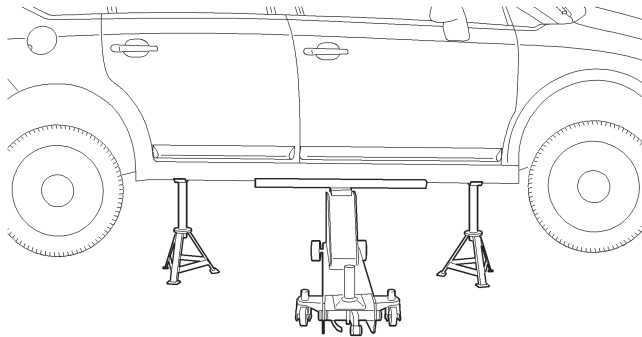
E2AP018C



E2AP017C

## GENERAL SPECIFICATION: LIFTING AND SUPPORTING THE VEHICLE

### Lifting and supporting the vehicle (continued)



E2AP02HD

Side lifting crossmember (-).0010

#### Positioning of the crossmember.

Take weight on the sill rebate with the crossmember as close as possible to the mating edge.

Position the axle stand at the point provided for lifting the vehicle with the jack.

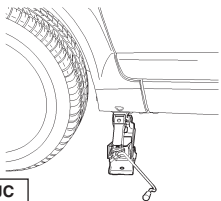
**NOTE:** To have **2 wheels** hanging, repeat the operation on the other side.



# GENERAL SPECIFICATION: LIFTING AND SUPPORTING THE VEHICLE

## Lifting and supporting the vehicle (continued)

### Lifting with the jack at the front

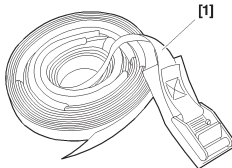


E2AP02JC

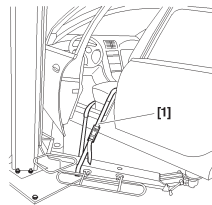
### Raising the vehicle on a lift, supported from the jacking points

Tooling

[1] Safety straps

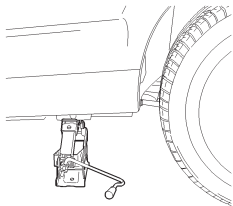


E5AP2DNC



E2AP02FC

### Lifting with the jack at the rear



E2AP02KC

**Lifting from the rear.**

**IMPERATIVE:** Do not lift the vehicle by the rear.

**Equipment involved.**

**Two-column lift.**

Auxiliary lift with blocks.

**IMPERATIVE:** Position the safety straps, if placing the vehicle on a lift supported from the jacking points (*risk of the vehicle overbalancing when a heavy component is removed*).

**Using the safety straps.**

**WARNING:** Check the condition of the safety straps before using them, do not use worn safety straps.

**Example:**

**Two-column lift.**

Place the safety straps [1] under the arm of the lift and criss-crossing the vehicle.

**NOTE:** The handle jack is specific to the vehicle, do not use it for any other purposes.

## CAPACITIES (in litres)

### Draining method.

The oil capacities are defined according to the following methods.

- 1/ Vehicle on level surface (*in high position, if equipped with hydropneumatic suspension*).
- 2/ Engine warm (*oil temperature 80°C*).
- 3/ Draining of the oil sump + removal of the cartridge (*duration of draining + dripping = 15 min*).
- 4/ Refit plug + cartridge.
- 5/ Engine filling.
- 6/ Engine starting (*allowing the cartridge to be filled*).
- 7/ Engine stopped (*stationary for 5 min*).

**ESSENTIAL: Systematically check the oil level using the oil dipstick.**

CAPACITIES (in litres)					
	C4				
	Petrol				
	1.4i 16V	1.6i 16V	2.0i 16V	2.0i	2.0i 16V
		AUTO.		AUTO.	
Engine type	KFU	NFU	RFN	RFJ	RFK
Oil capacity with change of cartridge	3,75	3,25	4,25	4,25	5,3
Between min. and max.	1,2	1,2	1,7	1,7	1,5
Manual gearbox	2 ± 0,15		2		2
Automatic gearbox					
After draining		(1)		(1)	
Braking circuit	WITH ESP = 0,85			WITHOUT ESP = 0,75	
Cooling circuit					
Manual gearbox	5,8	6,2	6,2 (2) – 6,6 (3)	6,2 (2) – 6,6 (3)	6,6
Automatic gearbox		6,7		6,8 (2) – 6,9 (3)	
Steering electro-pump reservoir	0,85				
Fuel tank	60				
<b>IMPERATIVE: Systematically check the oil level using the oil dipstick.</b>					
<b>(1)</b> = The gearbox is <b>lubricated for life</b> (as a guide, the TOTAL capacity is <b>5.85 litres</b> after draining <b>3 litres</b> ).					
<b>(2)</b> = Temperature <b>37°C</b> . <b>(3)</b> = Temperature <b>45°C</b> .					

CAPACITIES (in litres)				
	C4			
	Diesel			
	1.6 HDi 16V			2.0 HDi 16V
Engine type	9HX	9HY	9HZ	RHR
Oil capacity with change of cartridge	3,75			5,25
Between min. and max.	1,8			2
Manual gearbox	2			2,7
Braking circuit	WITH ESP = 0,85		WITHOUT ESP = 0,75	
Cooling circuit	6,5			8,1
Additive reservoir			2,5	2,5
Steering electro-pump reservoir	0,85			
Fuel tank	60			
<b>NOTE: (*)</b> = Version with additional heating. <b>IMPERATIVE: Systematically check the oil level using the oil dipstick.</b>				

## LUBRICANTS - TOTAL recommended oils

**Evolutions (year 2004).**

### CITROËN C4.

#### **Petrol engine versions.**

Normal maintenance interval : 30 000 Km (20 000 miles).

Severe maintenance interval : 20 000 Km (12 000 miles).

#### **Diesel engine versions.**

**WARNING:** Vehicles HDi FAP (\*) do not accept the energy economy oil **TOTAL ACTIVA FUTUR 9000 5W30** for France, **TOTAL QUARTZ FUTURE 9000 5W30** outside France.

#### **Family DV6:**

Normal maintenance interval : 20 000 Km (12 500 miles).

Severe maintenance interval : 15 000 Km (10 000 miles).

#### **Family DW:**

Normal maintenance interval : 30 000 Km (20 000 miles).

Severe maintenance interval : 20 000 Km (12 000 miles).

(\*) **FAP** = Particle filter.

### CITROËN C5 Restyled

#### **Petrol engine versions.**

Normal maintenance interval : 30 000 Km (20 000 miles).

Severe maintenance interval : 20 000 Km (12 000 miles).

#### **Diesel engine versions.**

**WARNING:** Vehicles HDi FAP (\*) do not accept the energy economy oil **TOTAL ACTIVA FUTUR 9000 5W30** for France, **TOTAL QUARTZ FUTURE 9000 5W30** outside France.

#### **Family DV6:**

Normal maintenance interval : 20 000 Km (12 500 miles).

Severe maintenance interval : 15 000 Km (10 000 miles).

#### **Family DW:**

Normal maintenance interval : 30 000 Km (20 000 miles).

Severe maintenance interval : 20 000 Km (12 000 miles).

**ESSENTIAL:** For all vehicles with a 30 000 km (20 000 miles) maintenance interval, use exclusively **TOTAL ACTIVA/QUARTZ 7000 or 9000** or any other oils offering identical specifications to these.

These oils offer specifications that are superior to those defined by norms **ACEA A3 OR API SJ/CF**.

Failing this, it is essential to adhere to the maintenance programmes covering severe operating conditions.

## LUBRICANTS - TOTAL recommended oils

### Use of oil grade 10W40.

Possibility to use the semi-synthetic oil **7000 10W40** on vehicles **HDi** and **HDi FAP**.

**WARNING:** To avoid difficulties starting from cold (<20°C),  
Use oil 5W40.

For further details, see oil utilisation table.

### Commercial description of energy economy oil.

Energy economy oil is called:

**TOTAL ACTIVA FUTUR 9000 5W30** in France.

**TOTAL QUARTZ FUTURE 9000 5W30** outside France.

Exclusions of use of this oil are:

**XSARA VTS 2.0i 16V** (XU10J4RS).

**JUMPER/RELAY 2.8 TDi ; 2.8 HDi** (SOFIM engine).

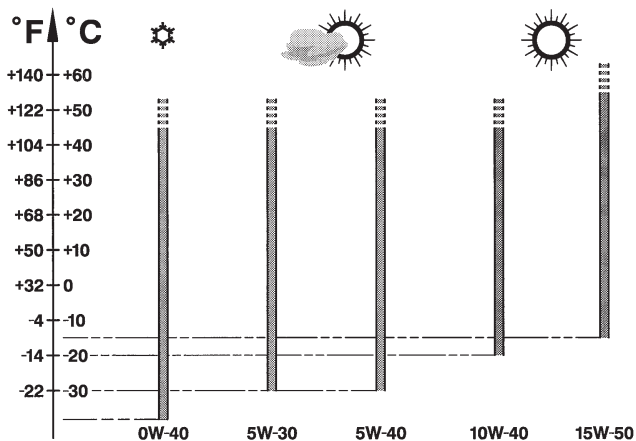
Vehicles **HDi FAP**.

**CITROËN C3 1.6i 16V** (DV4TED4).

**CITROËN C8 2.2i** (EW12J4).

**CITROËN C4 and C5** (EW10A).

## LUBRICANTS - TOTAL recommended oils



E4AP006D

## Engine oil norms.

## Current norms.

The classification of these engine oils is established by the following recognised organisations:

- **S.A.E** : Society of Automotive Engineers.
- **API** : American Petroleum Institute.
- **ACEA** : Association des Constructeurs Européens d'Automobiles

## LUBRICANTS - TOTAL recommended oils

**S.A.E. Norms - Table for selection of engine oil grade.**

**Selection of engine oil grades recommended for climatic conditions in countries of distribution.**

### Evolution of the norms as at 01/01/2003

#### ACEA 2003 norms

The meaning of the first letter has not changed, it still corresponds to the type of engine:

**A:** petrol and dual fuel petrol/LPG engines.

**B:** diesel engines.

The figure following the first letter corresponds to the type of oil:

**3:** high performance oils.

**4:** oils specifically for direct injection diesel engines.

**5:** very high performance oils permitting lower fuel consumption.

#### Example:

**ACEA A3:** high performance oils specifically for petrol and dual fuel petrol/LPG engines

**ACEA A/B:** blended oils giving very high performance for all engines, also permitting better fuel economy, specifically for direct injection diesel engines

**NOTE:** From **01/01/2003** there is no longer any reference to the year of creation of the norm (example: **ACEA A3/B3 98** becomes **ACEA A3/B3**).

#### API norms

The meaning of the first letter has not changed, it still corresponds to the type of engine:

**S:** petrol and dual fuel petrol/LPG engines.

**C:** diesel engines.

The second letter corresponds to the degree of evolution of the oil (*ascending order*).

**Example:** Norm **SL** is more severe than norm **SJ**, corresponding to a higher level of performance.



## LUBRICANTS - TOTAL recommended oils

### Recommendations.

**ESSENTIAL:** To preserve engine performances, all engines fitted in CITROËN vehicles must be lubricated with high quality oils (*synthetic or semi-synthetic*).

CITROËN engines are lubricated at the factory with **TOTAL** oil of grade **S.A.E 5W-30**.  
**TOTAL** oil of grade **S.A.E 5W-30** allows improved fuel economies (*approx 2.5%*).

The oil **5W30** is used only for the following engines (*Year 2004*):

- |             |   |
|-------------|---|
| - XU10 J4RS | : XSARA VTS 2.0i 16V ( <i>3-door</i> ). |
| - SOFIM     | : JUMPER/RELAY 2.8 TDi and 2.8 HDi.     |
| - HDi       | : With particle filter ( <i>FAP</i> ).  |
| - DV4 TED4  | : CITROËN C3 1.4 16V HDi.               |
| - EW 12J4   | : CITROËN C8 2.2i 16V.                  |
| - EW 10A    | : CITROËN C4 and C5.                    |

**WARNING:** CITROËN engines prior to model year 2000 do not have to be lubricated with oils adhering to the norms: ACEA AI-98 and API SJ/CF EC or current norms ACEA A5/B5.

Denomination of **TOTAL** oils according to country of marketing:

**TOTAL ACTIVA** (*France only*).

**TOTAL QUARTZ** (*outside France*).

## LUBRICANTS - TOTAL recommended oils

### Recapitulation

Norms to be observed for engine oils (year 2003)			
Year	Types of engine concerned	ACEA norms	API norms
2003	Petrol and dual fuel petrol/LPG engines	A3 or A5 (*)	SJ or SL
	Diesel engines	B3, B4 or B5 (*)	CF

(\*) It is essential not to use engine oils respecting these norms for the following engine-types: XU10 J4RS, SOFIM 2.8 TDi and SOFIM 2.8 HDi, HDi with particle filter (FAP), EW10A, EW 12 J4, DV4 TED4.

### Classes and grades of TOTAL recommended engine oils.

Oils marketed in each country are adapted to the local climatic conditions.

Blended oils for all engines (petrol, diesel and dual fuel petrol/LPG engines)			
	S.A.E norms	ACEA norms	API norms
TOTAL ACTIVA 9000 TOTAL QUARTZ 9000	5W40	A3 / B3 / B4	SL / CF
TOTAL ACTIVA FUTUR 9000 (*)	5W30	A5 / B5	
TOTAL QUARTZ FUTUR 9000 (*)			
TOTAL ACTIVATRAC	10W40	A3 / B3	SJ / CF

(\*) Blended oils for all engines, permitting fuel economy.

## LUBRICANTS - TOTAL recommended oils

Oils specifically for petrol and dual fuel petrol/LPG engines			
	S.A.E norms	ACEA norms	API norms
TOTAL ACTIVA 7000 TOTAL QUARTZ 7000	10W40	A3	SL
TOTAL QUARTZ 9000	0W40		SJ
TOTAL ACTIVA 7000 TOTAL QUARTZ 7000	15W50		SL

Oils specifically for diesel engines			
	S.A.E norms	ACEA norms	API norms
TOTAL ACTIVA DIESEL 7000 TOTAL QUARTZ DIESEL 7000	10W40	B3	CF
TOTAL ACTIVA DIESEL 7000	15W50		

## LUBRICANTS - TOTAL recommended oils

Oil usage table

Engines versions		Huile TOTAL ACTIVA QUARTZ				
		Synthetic 9000			Semi-synthetic 7000	
		0W40	5W30	5W40	10W40	15W50
		cold countries				
			temperate countries			
				hot countries		
Petrol engines	XU10 J4RS (C4)	X		X	X	X
	EW 12 J4 (C8 2.2i 16V)	X		X	X	X
	Other petrol engines	X		X	X	X
	HDi engines with FAP (*)	X	X	X	X	X
Diesel engines	Other HDi engines			X	X (1)	X
	SOFIM 2.8 TDi and 2.8 HDi (RELAY)		X	X	X	X
	DV4 TED4 (C3 1.4 16V HDi)			X	X	X
	Indirect injection diesel engines			X	X	X
	XU10 J4RS (Xsara VTS 2.0i 16V)		X	X	X	X

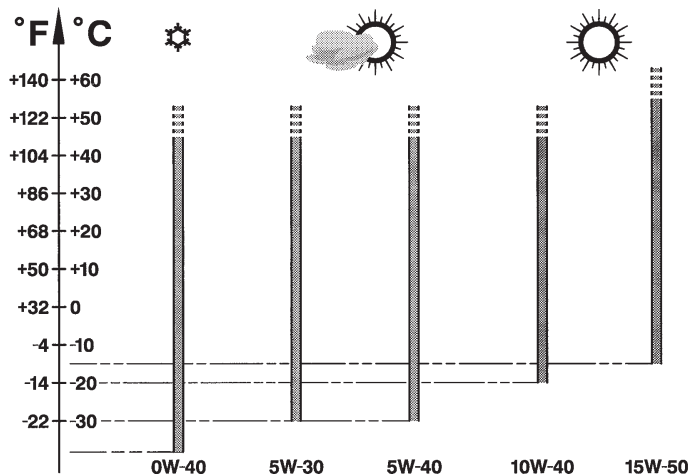
(\*) = Particle filter.

(1) = Do not use this oil in cold climatic conditions.

For the choice of grade of **TOTAL** engine oils to be used depending on the climatic conditions in the country of marketing: see table below.

## LUBRICANTS - TOTAL recommended oils

Selection of TOTAL engine oils, to be used according to the climatic conditions in the country where the vehicle is marketed.



LUBRICANTS - TOTAL recommended oils			
FRANCE		ENGINE OILS	
	Blended oils for all engines, supplied in bulk		
Metropolitan FRANCE	TOTAL ACTIVRAC		S.A.E norms: 10W40
	TOTAL ACTIVA		TOTAL ACTIVA DIESEL
	Blended oils for all engines	Oils specifically for petrol and dual-fuel petrol/LPG engines	Oils specifically for diesel engines
Metropolitan FRANCE	900 5W40 9000 5W30 (*)	7000 10W40	7000 10W40 9000 5W40
New Caledonia	9000 5W40	7000 15W50	7000 15W50
Guadeloupe			
Saint martin			
Reunion			
Martinique			
Guyana			
Tahiti			
Mauritius			
Mayotte			
(*) Blended oils for all engines, permitting fuel economy.			

GENERAL

LUBRICANTS - TOTAL recommended oils			
ENGINE OILS			
EUROPE	TOTAL ACTIVA		TOTAL ACTIVA DIESEL
	Blended oils for all engines	Oils specifically for petrol and dual-fuel petrol/LPG engines	Oils specifically for diesel engines
Germany	9000 5W40 FUTURE 9000 5W30 (*)	7000 10W40 9000 0W40	7000 10W40
Austria		7000 10W40	
Belgium		7000 10W40 9000 0W40	
Bosnia		7000 10W40 9000 0W40	
Bulgaria		7000 10W40	
Cyprus		7000 10W40 9000 15W40	
Croatia		7000 10W40	
(*) Blended oils for all engines, permitting fuel economy.			

LUBRICANTS - TOTAL recommended oils			
ENGINE OILS			
EUROPE	TOTAL ACTIVA		TOTAL ACTIVA DIESEL
	Blended oils for all engines	Oils specifically for petrol and dual-fuel petrol/LPG engines	Oils specifically for diesel engines
Denmark	9000 5W40 FUTURE 9000 5W30 (*)	7000 10W40 9000 0W40	7000 10W40
Spain		7000 10W40 7000 15W40	
Estonia		7000 10W40 9000 0W40	
Finland			
Great Britain		7000 10W40	
Greece		7000 10W40 7000 15W40	
Holland		7000 10W40 9000 0W40	
(*) Blended oils for all engines, permitting fuel economy.			



LUBRICANTS - TOTAL recommended oils			
ENGINE OILS			
EUROPE	TOTAL ACTIVA		TOTAL ACTIVA DIESEL
	Blended oils for all engines	Oils specifically for petrol and dual-fuel petrol/LPG engines	Oils specifically for diesel engines
Hungary	9000 5W40 FUTURE 9000 5W30 (*)	7000 10W40 9000 0W40	7000 10W40
Italy			
Ireland		7000 10W40	
Iceland			
Latvia		7000 10W40 9000 0W40	
Lithuania			
Macedonia		7000 10W40	
(*) Blended oils for all engines, permitting fuel economy.			

LUBRICANTS - TOTAL recommended oils			
ENGINE OILS			
EUROPE	TOTAL ACTIVA		TOTAL ACTIVA DIESEL
	Blended oils for all engines	Oils specifically for petrol and dual-fuel petrol/LPG engines	Oils specifically for diesel engines
Malta	9000 5W40 FUTURE 9000 5W30 (*)	7000 10W40 7000 15W50	7000 10W40
Moldavia		7000 10W40	
Norway		7000 10W40 9000 0W40	
Poland		7000 10W40	
Portugal			
Slovakia		7000 10W40 9000 0W40	
Czech Republic			
(*) Blended oils for all engines, permitting fuel economy.			

LUBRICANTS - TOTAL recommended oils			
ENGINE OILS			
EUROPE	TOTAL ACTIVA		TOTAL ACTIVA DIESEL
	Blended oils for all engines	Oils specifically for petrol and dual-fuel petrol/LPG engines	Oils specifically for diesel engines
Romania	9000 5W40 FUTURE 9000 5W30 (*)	7000 10W40 7000 15W50 9000 0W40	7000 10W40
Russia		7000 10W40 9000 0W40	
Slovenia			
Sweden		7000 10W40	
Switzerland			
Turkey		7000 10W40 9000 15W50 9000 0W40	
(*) Blended oils for all engines, permitting fuel economy.			

LUBRICANTS - TOTAL recommended oils			
ENGINE OILS			
EUROPE	TOTAL ACTIVA		TOTAL ACTIVA DIESEL
	Blended oils for all engines	Oils specifically for petrol and dual-fuel petrol/LPG engines	Oils specifically for diesel engines
Ukraine	9000 5W40 FUTURE 9000 5W30 (*)	7000 10W40 9000 0W40	7000 10W40
Serbia-Montenegro			
(*) Blended oils for all engines, permitting fuel economy.			

LUBRICANTS - TOTAL recommended oils			
ENGINE OILS			
OCEANIA	TOTAL ACTIVA		TOTAL ACTIVA DIESEL
	Blended oils for all engines	Oils specifically for petrol and dual-fuel petrol / LPG engines	Oils specifically for diesel engines
Australia New Zealand	9000 5W40 FUTURE 9000 5W30	7000 10W40	7000 10W40
AFRICA	TOTAL ACTIVA		TOTAL ACTIVA DIESEL
	Blended oils for all engines	Oils specifically for petrol and dual-fuel petrol / LPG engines	Oils specifically for diesel engines
Algeria, South Africa, Ivory Coast, Egypt, Gabon, Ghana, Kenya, Madagascar, Morocco, Nigeria, Senegal, Tunisia	9000 5W40	7000 15W50	7000 10W40
(*) Blended oils for all engines, permitting fuel economy.			

LUBRICANTS - TOTAL recommended oils			
ENGINE OILS			
CENTRAL AND SOUTH AMERICA	TOTAL ACTIVA		TOTAL ACTIVA DIESEL
	Blended oils for all engines	Oils specifically for petrol and dual-fuel petrol/LPG engines	Oils specifically for diesel engines
Argentina	9000 5W40	7000 10W50 7000 15W50	7000 10W40
Brazil			
Chile			
Cuba			
Mexico			
Paraguay			
Uruguay			

GENERAL

## LUBRICANTS - TOTAL recommended oils

### ENGINE OILS

#### SOUTH-EAST ASIA

#### TOTAL ACTIVA

#### TOTAL ACTIVA DIESEL

Blended oils for all engines

Oils specifically for petrol and  
dual-fuel petrol/LPG engines

Oils specifically for diesel  
engines

China

South Korea

Hong Kong

India – Indonésia

Japan

Malaysia

Pakistan

9000 5W40  
FUTURE 9000 5W30

9000 5W40

9000 5W40  
FUTURE 9000 5W30 (\*)

9000 5W40

7000 10W50  
7000 15W50

7000 10W40

7000 15W50

7000 10W40  
7000 15W50

7000 15W50

7000 10W40

(\*) Blended oils for all engines, permitting fuel economy.

GENERAL

LUBRICANTS - TOTAL recommended oils			
ENGINE OILS			
SOUTH-EAST ASIA	TOTAL ACTIVA		TOTAL ACTIVA DIESEL
	Blended oils for all engines	Oils specifically for petrol and dual-fuel petrol/LPG engines	Oils specifically for diesel engines
Philippines	9000 5W40	7000 15W50	7000 10W40
Singapore			
Taiwan		7000 10W40 7000 15W50	
Thailand			
Vietnam		7000 15W50	
(*) Blended oils for all engines, permitting fuel economy.			

GENERAL



LUBRICANTS - TOTAL recommended oils			
ENGINE OILS			
MIDDLE EAST	TOTAL ACTIVA		TOTAL ACTIVA DIESEL
	Blended oils for all engines	Oils specifically for petrol and dual-fuel petrol/LPG engines	Oils specifically for diesel engines
Saudi Arabia - Bahrain Dubai United Arab Emirates	9000 5W40	7000 15W50	7000 10W40
Iran		7000 10W40 7000 15W50	
Israel - Jordan - Kuwait - Lebanon Oman - Qatar - Syria - Yemen		7000 15W50	

## LUBRICANTS - TOTAL recommended oils

### GEARBOX OILS

Manual gearbox and piloted manual gearbox	All countries	TOTAL TRANSMISSION BV Norms S.A.E: 75W80 <b>Part No.: 9730 A2</b>
MB3 automatic gearbox		TOTAL FLUIDE ATX TOTAL FLUIDE AT 42 Special oil distributed by CITROËN <b>Part No.: 9730 A3</b>
4HP20 and AL4 autoactive automatic gearboxes		Special oil distributed by CITROËN <b>Part No.: 9736 22</b>
AM6 autoactive automatic gearboxes		Special oil distributed by CITROËN <b>Part No.: 9980 D4</b>
Transfer box and rear axle		TOTAL TRANSMISSION X4 <b>Part No.: 9730 A4</b>

## LUBRICANTS - TOTAL recommended oils

## POWER STEERING OILS

Power steering All vehicles except <b>CITROËN C4, C5</b>	All countries	TOTAL FLUIDE ATX
Power steering <b>CITROËN C4, C5</b>		TOTAL FLUIDE DA Special oil distributed by CITROËN <b>Part No.: 9979 69</b>
Power steering	Very cold countries	TOTAL FLUIDE DA Special oil distributed by CITROËN <b>Part No.: 9730 A1</b>

## ENGINE COOLANT FLUID

		Pack	CITROËN Part No.	
			GLYSANTIN G33	REVKOGEL 2000
All countries	CITROËN Fluid Protection: - 35C°	2 Litres	9979 70	9979 72
		5 Litres	9979 71	9979 73
		20 Litres	9979 76	9979 74
		210 Litres	9979 77	9979 75

## LUBRICANTS - TOTAL recommended oils

### BRAKE FLUID Synthetic brake fluid

		Pack	CITROËN Part No.
All countries	CITROËN fluid	0,5 Litre	9979 05
		1 Litre	9979 06
		5 Litres	9979 07

### HYDRAULIC CIRCUIT

All countries	Norm		Pack	CITROËN Part No.
TOTAL FLUIDE LDS	Colour	Orange	1 Litre	9979 69
TOTAL LHM PLUS		Green		ZCP 830095
TOTAL LHM PLUS Very cold countries				9979 20

**WARNING: TOTAL FLUIDE LDS** fluid cannot be blended with **TOTAL LHM**.

**WARNING: CITROËN C5: Use exclusively TOTAL FLUIDE LDS** suspension fluid.

All countries	<b>TOTAL HYDRAURINCAGE</b>
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# LUBRICANTS - TOTAL recommended oils

## SCREEN WASH FLUID

	Pack		CITROËN Part No.		
All countries	Concentrated: <b>250 ml</b>		<b>9980 33</b>	<b>ZC 9875 953U</b>	<b>9980 56</b>
	Fluid ready for use	1 Litre	<b>9980 06</b>	<b>ZC 9875 784U</b>	
		5 Litres	<b>9980 05</b>	<b>ZC 9885 077U</b>	<b>ZC 9875 279U</b>

## GREASE General use

		Norms NLGI
All countries	<b>TOTAL MULTIS 2</b>	<b>2</b>
	<b>TOTAL SMALL MECHANISMS</b>	

Note: **NLGI** = National Lubricating Grease Institute.

## ENGINE OIL CONSUMPTION

**I -** Oil consumption depends on:

- the engine type.
- how run-in or worn it is.
- the type of oil used.
- the driving conditions.

**II -** An engine can be considered **RUN-IN** after:

- **3,000 miles** (5,000 km) for a **PETROL** engine.
- **6,000 miles** (10,000 km) for a **DIESEL** engine.

**III - MAXIMUM PERMISSIBLE** oil consumption for a **RUN-IN** engine:

- **0.5 litres** per **600 miles** (1,000 km) for a **PETROL** engine.
- **1 litre** per **600 miles** (1,000 km) for a **DIESEL** engine.

**DO NOT INTERVENE BELOW THESE VALUES.**

**IV - OIL LEVEL:** The level should NEVER be above the **MAX.** mark on the dipstick after changing or topping up the oil.

- This excess oil will be used up rapidly.
- It will reduce the engine output and adversely affect the operation of the air circuits and gas recycling.

ENGINE SPECIFICATIONS					
	Petrol				
	1.4i 16V	1.6i 16V	2.0i	2.0i 16V	
Emission standard		EURO 4		IF EURO 4	
Engine type	KFU	NFU	RFJ	RFN	RFK
Cubic capacity (cc)	1360	1587	1997		
Bore / Stroke	75/77	78/82	85/88		
Compression ratio	11/1		10,8/1		
Power ISO or EEC (KW - rpm)	65-5250	80-5800	103-6000	99-6000	130-7000
Power DIN (HP - rpm)	90-5250	110-5800	140-6000	134-6000	177-7000
Torque ISO or EEC (m.daN - rpm)	13,3-4250	14,7-4000	19,5-3000	19-4100	20,2-4750
Torque DIN (mkg-rpm)	13,5-4250	15-4000	19,9-3000	19,4-4100	20,6-4750

## ENGINE SPECIFICATIONS

	Diesel			
	1.6 16V HDi			2.0 16V HDi
Emission standard	EURO 4	EURO 3 (with or without FAP)		EURO 4
Engine type	9HX	9HY	9HZ	RHR
Cubic capacity (cc)	1560			1997
Bore / Stroke	75/88,3			85/88
Compression ratio	18/1			18/1
Power ISO or EEC (KW - rpm)	66-4000	80-4000		100-4000
Power DIN (HP - rpm)	90-4000	110-4000		138-4000
Torque ISO or EEC (m.daN - rpm)	21,5-1750	24-1750 (26-1750 with temporary fuel boost (*))		32-2000
Torque DIN (mkg-rpm)	24,97-2000			32,6-2000

(\*) = **Temporary fuel boost** means that in certain operating phases, the quantity of fuel injected is slightly greater in order to increase the engine torque.

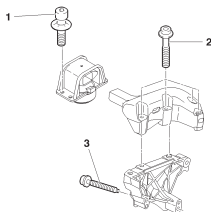


# SPECIAL FEATURES: TIGHTENING TORQUES

## Suspensions for engine/gearbox assembly

Engine: KFU

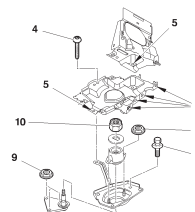
### Gearbox on RH side



B1BP36BD

1	$6 \pm 0,6$
2	$6 \pm 0,1$
3	$4,5 \pm 0,4$

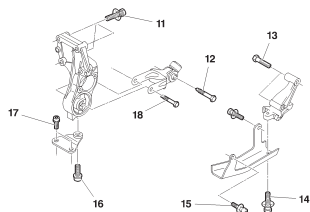
### Gearbox on LH side



B1BP36CD

4	$1 \pm 0,2$
5	$1,8 \pm 0,2$
6	$2 \pm 0,2$
7	$3 \pm 0,3$
8	$1,9 \pm 0,1$
9	$2,5 \pm 0,2$
10	$6,5 \pm 0,6$

### Gearbox below the engine

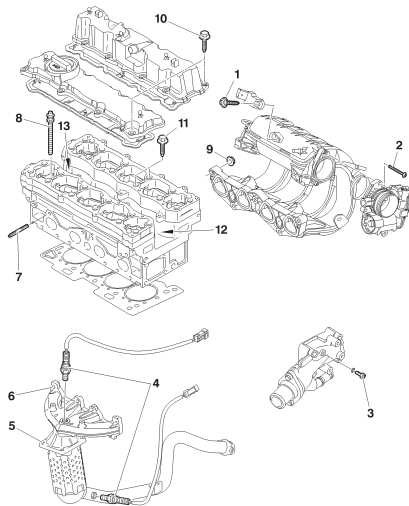


B1BP36DD

11	$4 \pm 0,4$
12	$4 \pm 0,4$
13	$4 \pm 0,4$
14	$4 \pm 0,4$
15	$4 \pm 0,4$
16	$2 \pm 0,2$
17	$4 \pm 0,4$
18	$5,4 \pm 0,5$

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: KFU



B1BP368P

Cylinder head		
1	Inlet air pressure sensor	0,8 ± 0,1
2	Motorised butterfly housing fixing screws	0,8 ± 0,2
3	Coolant outlet housing screws	0,8 ± 0,2
4	Oxygen sensor	4,7 ± 0,7
5	Catalytic converter fixing nuts (*)	
	Pre-tightening	2 ± 0,2
	Tightening	4 ± 0,4
	Check the tightening	4 ± 0,4
6	Exhaust manifold nuts	1,8 ± 0,2
7	Exhaust manifold fixing stud	0,8 ± 0,1
8	Cylinder head bolts (*)	
	Pre-tightening	1,5 ± 0,2
	Tightening	2,5 ± 0,2
	Angular tightening	200° ± 5°
9	Inlet manifold screws	0,8 ± 0,1
10	Valve cover screws (*)	0,9 ± 0,1
11	Camshaft bearing cap screws (*)	1 ± 0,1
12	Sparking plugs	2,25 ± 0,2
13	Camshaft dephaser electrovalve fixing screws (VVT)	0,8 ± 0,2

(\*) = IMPERATIVE: Respect the tightening sequence (see following page).

# SPECIAL FEATURES: TIGHTENING TORQUES

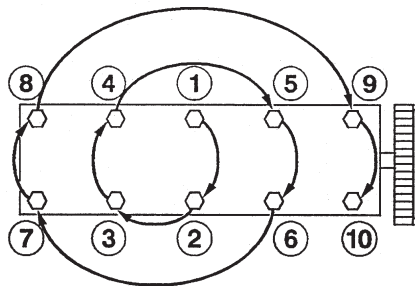
Engine: KFU

Cylinder head

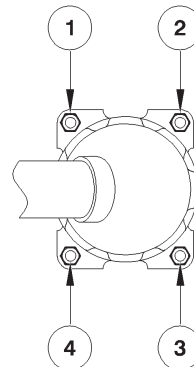
**IMPERATIVE: Respect the tightening sequence.**

- (8) Cylinder head bolts
- (10) Valve cover screws
- (11) Camshaft bearing cap screws

- (5) Catalytic converter fixing nuts



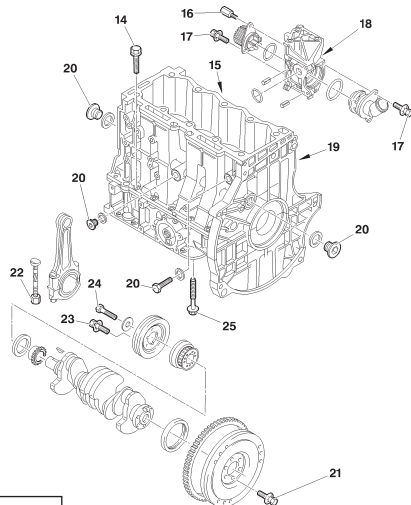
B1DP05BC



B1JP063C

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: KFU



B1BP368P

Cylinder block		
14	Crankshaft bearing cap sealing screw (*)	$0,8 \pm 0,1$
15	Knock sensor	$2 \pm 0,4$
16	Coolant pump stud screw	$1,6 \pm 0,2$
17	Coolant pump cover screw	$0,6 \pm 0,1$
18	Screw of coolant pump body on cylinder block	$6,5 \pm 0,6$
19	Cooling circuit plug	$3 \pm 0,5$
20	Oil circuit plugs	$3 \pm 0,5$
21	Flywheel screw (*)	$6,7 \pm 0,6$
22	Con rod cap fixing nut	$3,7 \pm 0,4$
23	Accessories drive belt pulley screw	$0,8 \pm 0,2$
24	Crankshaft pinion screw Tightening Angular tightening	$4 \pm 0,4$ $45^\circ \pm 4^\circ$
25	Crankshaft bearing cap cover screw (*) Tightening Angular tightening	2 $44^\circ \pm 4^\circ$

(\*) = IMPERATIVE: Respect the tightening sequence (see following page).

# SPECIAL FEATURES: TIGHTENING TORQUES

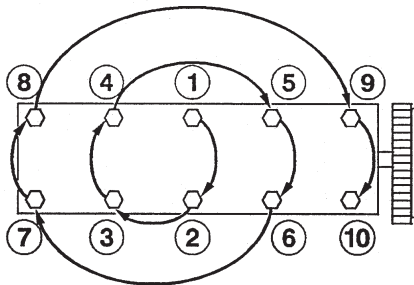
Engine: KFU

Cylinder block

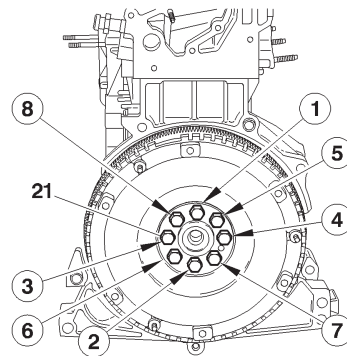
**IMPERATIVE: Respect the tightening sequence.**

- (14) Crankshaft bearing cap sealing screw
- (25) Crankshaft bearing cap cover screw

- (21) Flywheel screw



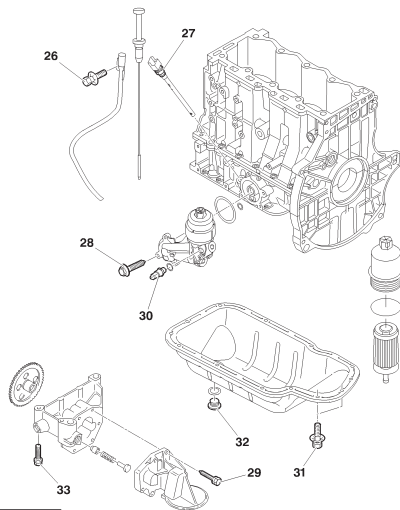
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B1CP0GYC

# **SPECIAL FEATURES: TIGHTENING TORQUES**

Engine: KFU



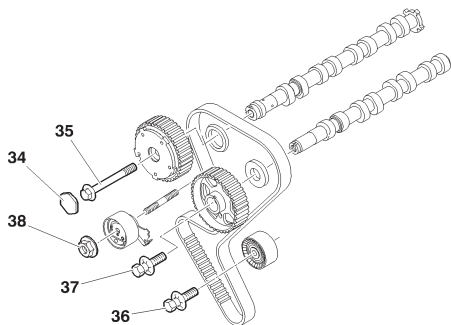
B1BP369P

## **Lubrication**

26	Oil gauge screw	$0,7 \pm 0,1$
27	Electric oil gauge fixing screw	$3,2 \pm 0,5$
28	Oil filter support screw	$1 \pm 0,1$
29	Strainer fixing screw	$1 \pm 0,1$
30	Oil pressure switch	$2 \pm 0,2$
31	Oil sump screw	$0,8 \pm 0,2$
32	Drain plug	$3 \pm 0,5$
33	Oil pump screw	$0,9 \pm 0,1$

# **SPECIAL FEATURES: TIGHTENING TORQUES**

Engine: KFU



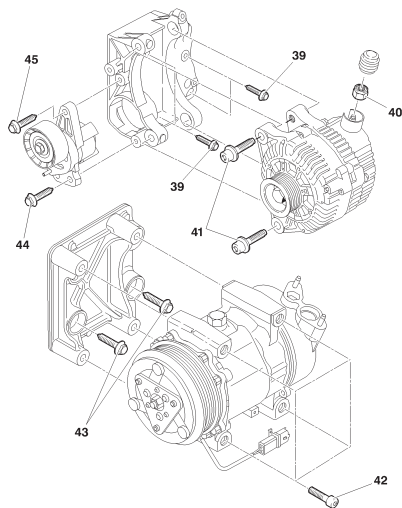
B1EP1GPD

## **Timing**

<b>34</b>	<b>Inlet camshaft dephaser plug (VVT)</b>	<b>3,2 ± 0,2</b>
<b>35</b>	<b>Inlet camshaft dephaser screw (VVT)</b>	
	Pre-tightening	<b>2 ± 0,2</b>
	Tightening	<b>6 ± 0,6</b>
<b>36</b>	<b>Guide roller screw</b>	<b>2,1 ± 0,2</b>
<b>37</b>	<b>Exhaust camshaft pulley screw</b>	<b>4,5 ± 0,4</b>
<b>38</b>	<b>Tensioner roller screw</b>	<b>2,1 ± 0,2</b>

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: KFU



B1BP36AP

Accessories		
39	Alternator support fixing screw	$2,5 \pm 0,3$
40	Alternator power circuit fixing nut	$1,4 \pm 0,2$
41	Alternator fixing screw	$4 \pm 0,4$
42	Aircon compressor fixing screw	$2,4 \pm 0,1$
43	Aircon compressor support fixing screw	$2,5 \pm 0,4$
44	Bottom screw fixing tensioner roller support	$5,7 \pm 1$
45	Top screw fixing tensioner roller support	$2,5 \pm 0,6$



# CYLINDER HEAD

Engine: KFU

## Identification of cylinder head gasket

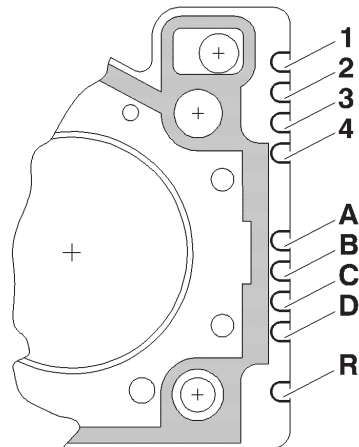
Engine types	Thicknesses (Standard)	Thicknesses (repair)	Thickness references
KFU	$1,2 \pm 0,1$	$1,5 \pm 0,1$	3

Engine type : 1 to 4

Supplier (MEILLOR) : A B D

Cylinder head gasket without asbestos : Ref. C

Repair ref. : R

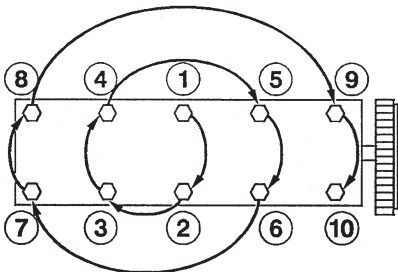


B1BP10KC

# CYLINDER HEAD

Engine: KFU

## Cylinder head tightening (m.daN)



(Sequence from 1 to 10)

Pre-tightening :  $1,5 \pm 0,2$

Tightening :  $2,5 \pm 0,2$

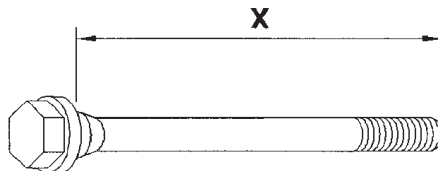
Angular tightening :  $200^\circ \pm 5^\circ$

**NOTE:** Oil the threads and under the heads of the bolts (use engine oil or Molykote G Rapid Plus).

Retightening of the cylinder head after a completed repair is prohibited.

B1DP05BC

## Cylinder head bolts



B1BP1DVC

**X = MAXIMUM reusable length**

**KFU**

**X = 119 mm**

**Cleaning to be carried out just prior to refitting.**

**WARNING:** Clean the contact faces with the approved cleaning product. Do not use abrasives or cutting tools on the contact faces. The contact faces must not bear any traces of impact or scratching.

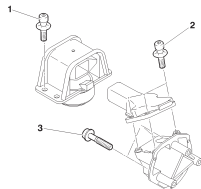
Brush the threads of the cylinder head bolts.

# SPECIAL FEATURES: TIGHTENING TORQUES

## Suspensions for engine/gearbox assembly

Engine: NFU

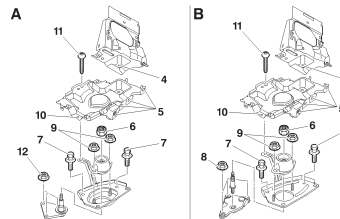
### Gearbox on RH side



B1BP35WD

1	$6 \pm 0,6$
2	$6 \pm 0,6$
3	$4,5 \pm 0,4$

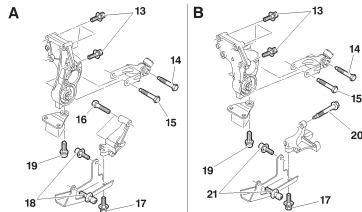
### Gearbox on LH side



B1BP35XD

4	$1,8 \pm 0,2$
5	$2 \pm 0,2$
6	$6,5 \pm 0,6$
7	$1,9 \pm 0,1$
8	$4 \pm 0,4$
9	$3 \pm 0,3$
10	$1,8 \pm 0,2$
11	$1 \pm 0,2$
12	$2,5 \pm 0,2$

### Gearbox below the engine



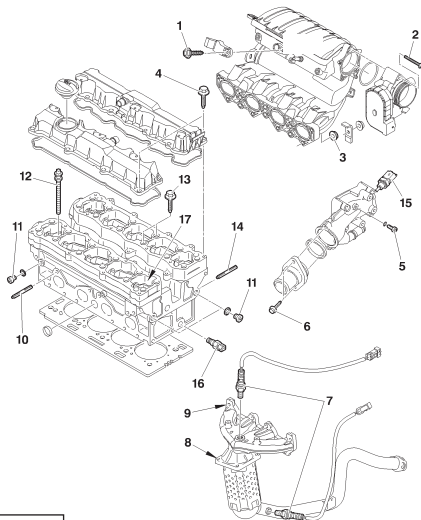
B1BP35YD

13	$4 \pm 0,4$
14	$4 \pm 0,4$
15	$5,4 \pm 0,5$
16	$6 \pm 0,6$
17	$4 \pm 0,4$
18	$6 \pm 0,6$
19	$2 \pm 0,2$
20	$4 \pm 0,4$
21	$4 \pm 0,4$

(A) MA manual gearbox  
(B) AL4 automatic gearbox

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: NFU



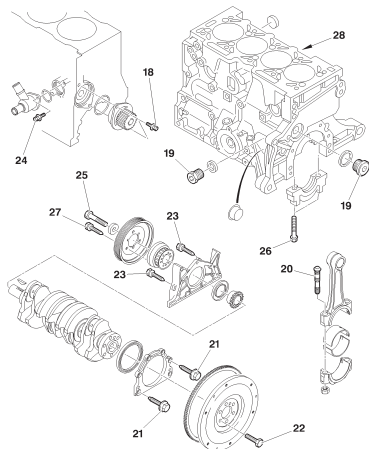
B1BP362P

Cylinder head		
1	Inlet air pressure sensor	$0,8 \pm 0,1$
2	Motorised butterfly housing fixing screws	$0,7 \pm 0,1$
3	Inlet manifold nuts	$0,8 \pm 0,2$
4	Valve cover screws (*)	$0,9 \pm 0,1$
5	Coolant outlet housing screws	$0,8 \pm 0,2$
6	Thermostat fixing screw	$0,8 \pm 0,2$
7	Oxygen sensor	$4,7 \pm 0,7$
8	Catalytic converter fixing nuts (*)	
	Pre-tightening	$1,8 \pm 0,3$
	Tightening	$4 \pm 0,4$
	Check the tightening	$4 \pm 0,4$
9	Exhaust manifold nuts	$2,3 \pm 0,5$
10	Exhaust manifold fixing stud	$0,8 \pm 0,1$
11	Lubrication plug	$1,5 \pm 0,2$
12	Cylinder head bolts (*)	
	Tightening	$2 \pm 0,2$
	Angular tightening	$260^\circ \pm 5^\circ$
13	Camshaft bearing cap screws (*)	$0,9 \pm 0,1$
14	Inlet manifold fixing stud	$0,8 \pm 0,1$
15	Engine coolant temperature sensor (CMM)	$1,7 \pm 0,1$
16	Engine coolant temperature sensor (instrument panel)	$1,7 \pm 0,1$
17	Sparking plugs	$3 \pm 0,1$

(\*) = IMPERATIVE: Respect the tightening sequence (see following page).

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: NFU



B1DP1KUP

## Cylinder block

18	Coolant pump screw	$2 \pm 0,1$
19	Oil plugs	$2,5 \pm 0,5$
20	Con rod cap bolt	$3,8 \pm 0,2$
21	Seal plate screw, flywheel end	$1 \pm 0,1$
22	Flywheel screw (*)	$7 \pm 0,7$
23	Seal plate screw, timing end	$1 \pm 0,1$
24	Coolant inlet manifold screw	$0,8 \pm 0,1$
25	Crankshaft pinion screw Tightening Angular tightening	$4 \pm 0,2$ $45^\circ \pm 3^\circ$
26	Crankshaft bearing cap screw Tightening Angular tightening	$2 \pm 0,1$ $49^\circ \pm 2^\circ$
27	Accessories drive belt pulley screw	$2,5 \pm 0,6$
28	Knock sensor	$2 \pm 0,5$

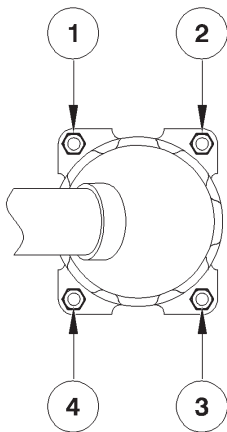
(\*) = IMPERATIVE: Respect the tightening sequence (see following page).

# SPECIAL FEATURES: TIGHTENING TORQUES

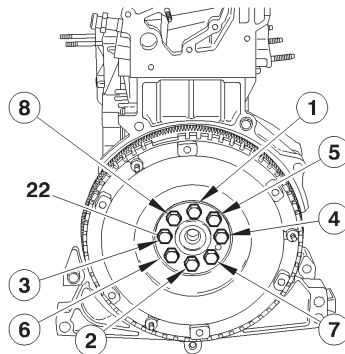
Engine: NFU

**IMPERATIVE: Respect the tightening sequence.**

Sequence of tightening the nuts **(8)** (Catalytic converter)



**(22)** Sequence of tightening the flywheel screws

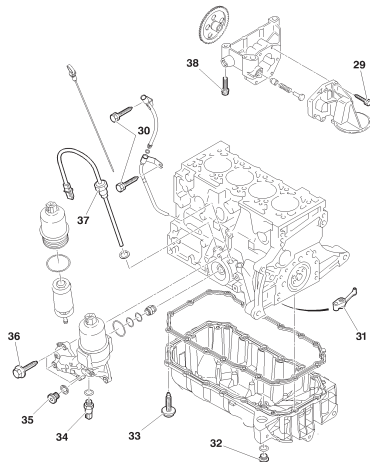


B1JP063C

B1CP0GCC

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: NFU



B1BP363P

## Lubrication

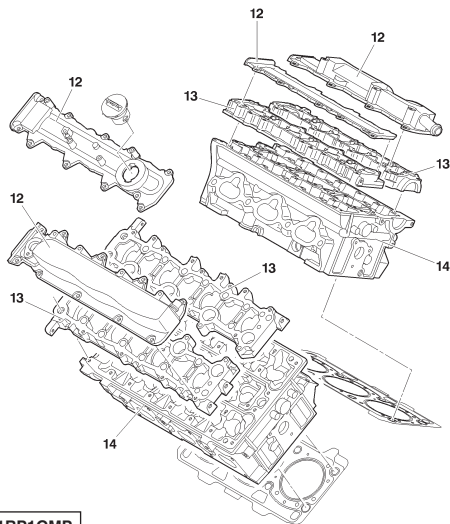
29	Strainer fixing	$0,8 \pm 0,2$
30	Oil gauge screw	$0,8 \pm 0,1$
31	Piston skirt spray jet	$1,5 \pm 0,2$
32	Drain plug	$3 \pm 0,5$
33	Oil sump screw	$0,8 \pm 0,1$
34	Oil pressure switch	$2 \pm 0,2$
35	Oil circuit plugs	$2,5 \pm 0,5$
36	Oil filter support screw	$0,8 \pm 0,2$
37	Oil level sensor	$0,8 \pm 0,2$
38	Oil pump screw	$0,9 \pm 0,1$

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: NFU

## Timing

39	Camshaft pulley screw	$4,5 \pm 0,5$
40	Guide roller screw	$2 \pm 0,2$
41	Tensioner roller screw	$2,1 \pm 0,4$

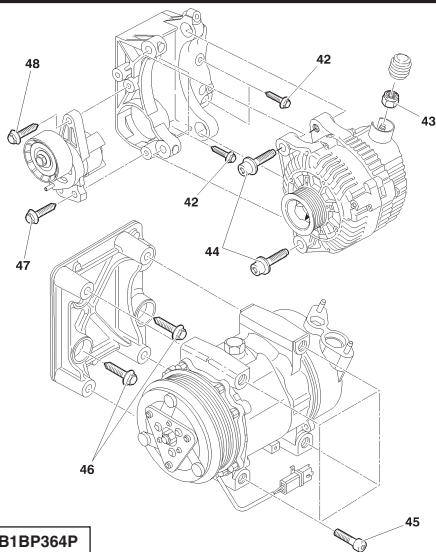


B1BP1GMP



# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: NFU



## Accessories

42	Alternator support fixing screw	2,5 ± 0,6
43	Alternator power circuit fixing nut	1,4 ± 0,2
44	Alternator fixing screw	4 ± 0,4
45	Aircon compressor fixing screw	2,5 ± 0,2
46	Tensioner roller support fixing screw	2,5 ± 0,6
47	Bottom screw fixing tensioner roller support	5,7 ± 1
48	Top screw fixing tensioner roller support	2,5 ± 0,6

# CYLINDER HEAD

Engine: NFU

## Identification of cylinder head gasket

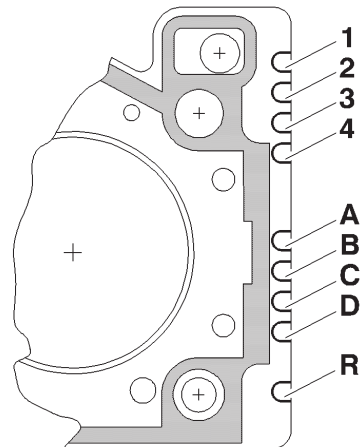
Engine types	Thicknesses (Standard)	Thicknesses (repair)	Thickness references
NFU	0,66 ± 0,04		4

Engine type : 1 à 4

Supplier (MEILLOR) : A B D

Cylinder head gasket without asbestos : Ref. C

Repair ref. : R

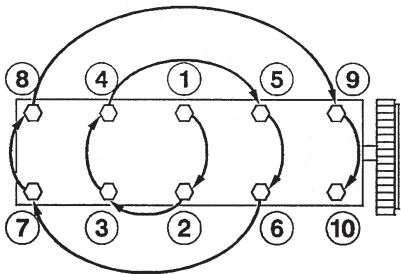


B1BP10KC

# CYLINDER HEAD

Engine: NFU

## Cylinder head tightening (m.daN)



Retightening of the cylinder head after a completed repair is prohibited.

B1DP05BC

Pre-tightening :  $2 \pm 0,2$

Angular tightening :  $260^\circ \pm 5^\circ$

**NOTE:** Oil the threads and under the heads of the bolts (*use engine oil or Molykote G Rapid Plus*).

## Cylinder head bolts



B1DP059C

**X = MAXIMUM reusable length**

**NFU**

**X =  $122 \pm 0,3$  mm**

**Cleaning to be carried out just prior to refitting.**

**WARNING:** Clean the contact faces with the approved cleaning product. Do not use abrasives or cutting tools on the contact faces. The contact faces must not bear any traces of impact or scratching.

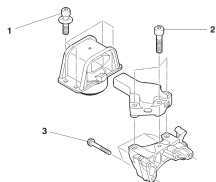
Brush the threads of the cylinder head bolts.

# SPECIAL FEATURES: TIGHTENING TORQUES

Suspensions for engine/gearbox assembly

Engine: RFJ

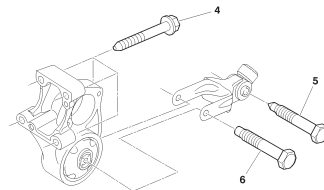
RH side



B1BP35TD

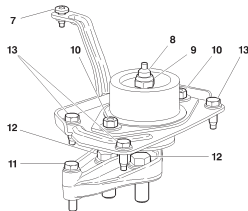
1	$6 \pm 0,6$
2	$6 \pm 0,6$
3	$4,5 \pm 0,4$

Torque reaction rod



B1BP35UD

4	$4,5 \pm 0,4$
5	$3,9 \pm 0,4$
6	$5,4 \pm 0,6$

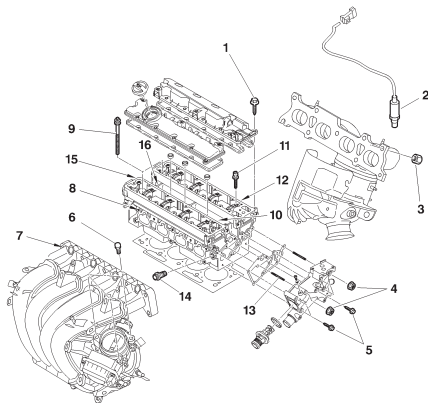


B1BP35VD

7	$1 \pm 0,1$
8	$5 \pm 0,5$
9	$6,5 \pm 0,6$
10	$3 \pm 0,3$
11	$3 \pm 0,3$
12	$6 \pm 0,6$
13	$1,9 \pm 0,2$

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: RFJ



B1BP35MP

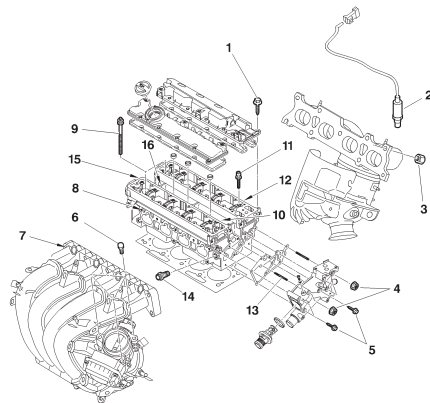
## Cylinder head

1	<b>Valve cover screws (*)</b> Pre-tightening Tightening	 0,5 $1,1 \pm 0,1$
2	<b>Oxygen sensor</b>	$4,7 \pm 0,5$
3	<b>Exhaust manifold nuts</b>	$3,5 \pm 0,3$
4	<b>Coolant outlet housing fixing nuts</b>	$1 \pm 0,1$
5	<b>Coolant outlet housing bolts</b>	0,3
6	<b>Motorised butterfly housing fixing screws</b>	$0,8 \pm 0,1$
7	<b>Inlet manifold fixings</b>	$2,2 \pm 0,4$
8	<b>Inlet manifold fixing studs</b>	$0,8 \pm 0,2$
9	<b>Cylinder head bolts (*)</b> Pre-tightening 1 Pre-tightening 2 Angular tightening Tightening Angular tightening	 $1,5 \pm 0,1$ $5 \pm 0,5$ 360° $2 \pm 0,2$ $285^\circ \pm 5^\circ$
10	<b>Sparking plugs</b>	$2,7 \pm 0,2$

(\*) = IMPERATIVE: Respect the tightening sequence (see following page).

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: RFJ



B1BP35MP

## Cylinder head

11	<b>Camshaft bearing cap screws (*)</b>	
	Pre-tightening	0,5
	Tightening	$1 \pm 0,1$
12	<b>Exhaust manifold fixing stud</b>	$0,8 \pm 0,2$
13	<b>Coolant outlet housing fixing stud</b>	$0,8 \pm 0,2$
14	<b>Engine coolant temperature sensor</b>	$1,7 \pm 0,1$
15	<b>Inner timing cover screw</b>	$0,8 \pm 0,1$
16	<b>Electrovalve fixing screw (VVT)</b>	$0,9 \pm 0,1$

(\*) = IMPERATIVE: Respect the tightening sequence (see following page).

# SPECIAL FEATURES: TIGHTENING TORQUES

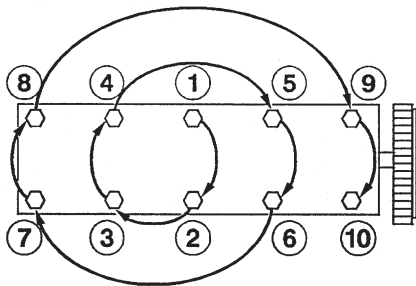
Engine: RFJ

Cylinder head

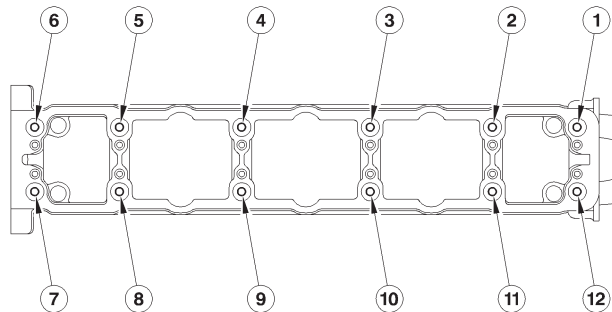
**IMPERATIVE: Respect the tightening sequence.**

- (1) Valve cover screws
- (9) Cylinder head bolts

- (11) Camshaft bearing cap screws



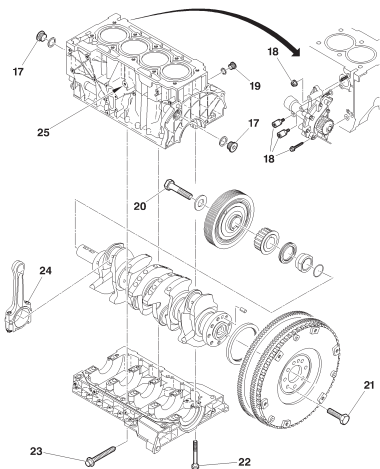
B1DP05BC



B1DP03XD

# **SPECIAL FEATURES: TIGHTENING TORQUES**

Engine: RFJ



B1DP1KSP

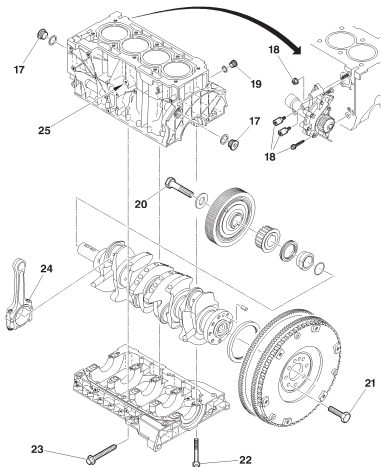
Cylinder block		
17	Oil circuit plugs	$3 \pm 0,3$
18	Coolant pump screw (*)	0,8
	Pre-tightening	$1,4 \pm 0,1$
19	Cooling circuit plug	$3 \pm 0,3$
20	Accessories drive belt pulley screw	$4 \pm 0,4$
	Tightening	$40^\circ \pm 4^\circ$
21	Flywheel screw (*)	$0,8 \pm 0,1$
	Pre-tightening	$2 \pm 0,2$
	Tightening	$21^\circ \pm 3^\circ$

(\*) = IMPERATIVE: Respect the tightening sequence (see following page).



# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: RFJ



B1DP1KSP

## Cylinder block

22	<b>Crankshaft bearing cap cover screw (*)</b>	1
	Pre-tightening	$2 \pm 0,2$
	Tightening	$72^\circ \pm 5^\circ$
23	<b>Crankshaft bearing cap sealing screw</b>	1
24	<b>Con rod cap bolt (*)</b>	1
	Pre-tightening	$2,3 \pm 0,2$
	Tightening	$46^\circ \pm 5^\circ$
25	<b>Knock sensor</b>	$2 \pm 0,5$

(\*) = IMPERATIVE: Respect the tightening sequence (see following page).

# **SPECIAL FEATURES: TIGHTENING TORQUES**

Engine: RFJ

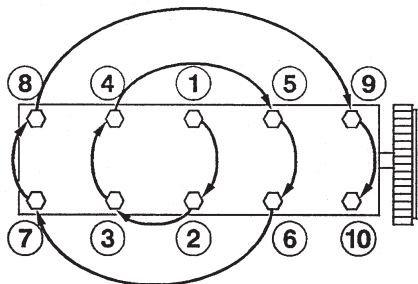
Cylinder head

**IMPERATIVE: Respect the tightening sequence.**

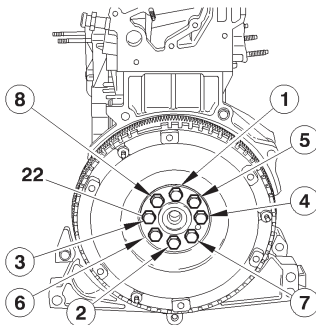
(22) Crankshaft bearing cap screws  
(24) Con rod cap bolt

(21) Flywheel screw

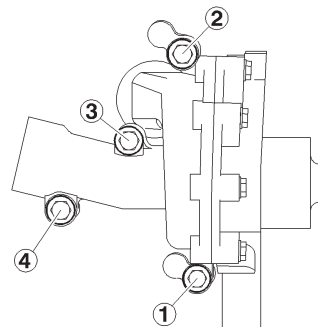
(18) Coolant pump screw



B1DP05BC



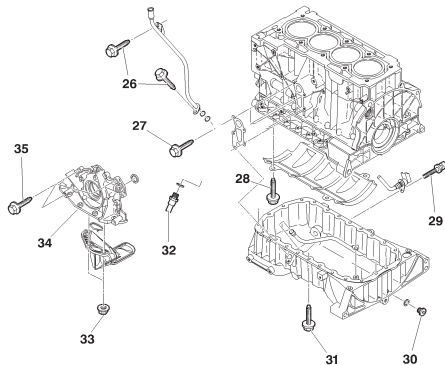
B1CP0GCC



B1GP08WC

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: RFJ



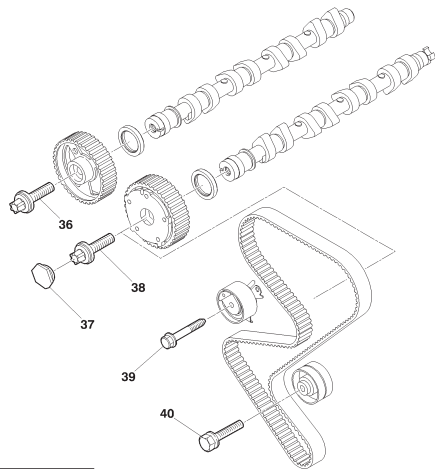
B1BP35NP

## Lubrication

26	Oil gauge screw	$1 \pm 0,2$
27	Oil filter support screw	$0,8 \pm 0,1$
28	Anti-emulsion plate fixing screw	$1,9 \pm 0,3$
29	Oil level sensor fixing screw	$1 \pm 0,2$
30	Drain plug	$3,4 \pm 0,3$
31	Oil sump screw	$0,8 \pm 0,1$
32	Oil pressure switch	$2 \pm 0,2$
33	Oil strainer fixing nuts	$0,8 \pm 0,1$
34	Oil strainer stud	$0,6 \pm 0,1$
35	Coolant pump screw	$0,7$
	Pre-tightening	$1 \pm 0,1$
	Tightening	

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: RFJ

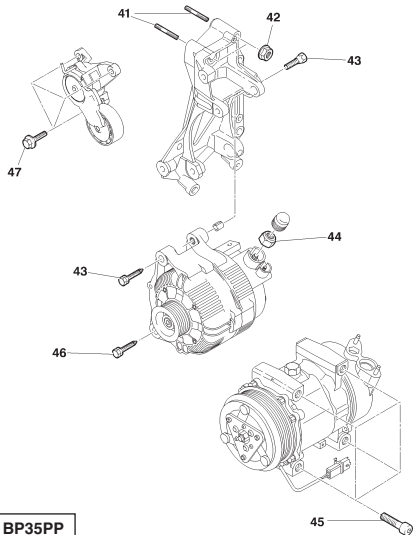


B1EP1GJP

Timing		
36	<b>Exhaust camshaft pulley screw</b>	
	Pre-tightening	$3 \pm 0,5$
	Tightening	$8,5 \pm 0,5$
37	<b>Cap</b>	$1,1 \pm 0,1$
38	<b>Inlet camshaft pulley screw</b>	
	Pre-tightening	$2 \pm 0,2$
	Tightening	$11 \pm 1$
39	<b>Tensioner roller screw</b>	$2,1 \pm 0,2$
40	<b>Guide roller screw</b>	
	Pre-tightening	$1,5 \pm 0,1$
	Tightening	$3,7 \pm 0,7$

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: RFJ



B1BP35PP

## Accessories

41	Accessories support fixing stud	0,8 ± 0,1
42	Accessories support fixings	1 ± 0,1
	Pre-tightening	1,9 ± 0,2
	Tightening	
43	Alternator top fixing screw	4,1 ± 0,5
44	Alternator power circuit fixing nut	1,7 ± 0,2
45	Aircon compressor fixing screw	2,3 ± 0,3
46	Alternator bottom fixing screw	4,9 ± 0,5
47	Screw for fixing the automatic tensioner roller for the accessories drive belt	2 ± 0,2

# CYLINDER HEAD

Engine: RFJ

## Identification of cylinder head gasket

Supplier **MEILLOR**

Thickness

$0,67 \pm 0,04$  mm

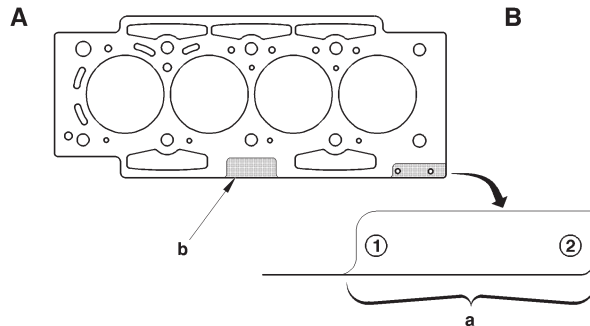
Multi-layer metallic cylinder head gasket

**A** : Timing end

**B** : Clutch end

**C** : Engraving zone

**D** : Marking zone

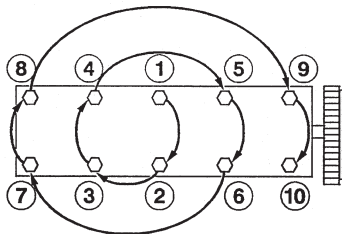


B1DP1LPD

# CYLINDER HEAD

Engine: RFJ

## Cylinder head tightening (m.daN)



Pre-tightening	: $1,5 \pm 0,1$
Tightening	: $5 \pm 0,1$
Angular tightening	: $360^\circ \pm 2^\circ$
Tightening	: $2 \pm 0,75$
Angular tightening	: $285^\circ \pm 5^\circ$

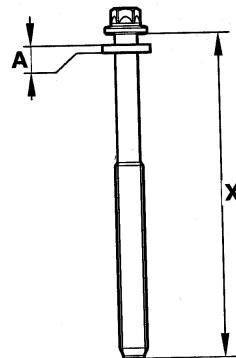
(Sequence from 1 to 10)

**WARNING:** Refit the cylinder head bolts priorly coated on the threads and under the heads with **Molykote G Rapid Plus**.

**NOTE:** Retightening of the cylinder head after a completed repair is prohibited.

B1DP05BC

## Cylinder head bolts



A = Thickness of the washer :  $4 \pm 0,2$

B1DP16FC

X = MAXIMUM reusable length

RFJ

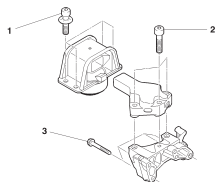
X =  $127,5 \pm 0,5$  mm

# SPECIAL FEATURES: TIGHTENING TORQUES

Suspensions for engine/gearbox assembly

Engine: RFN

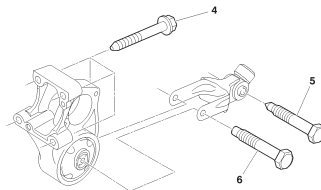
## Gearbox on RH side



B1BP35TD

1	$6 \pm 0,6$
2	$6 \pm 0,6$
3	$4,5 \pm 0,4$

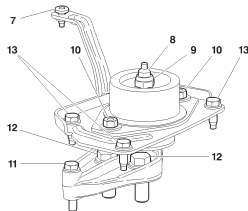
## Gearbox at torque reaction rod



B1BP35UD

4	$4,5 \pm 0,4$
5	$3,9 \pm 0,4$
6	$5,4 \pm 0,6$

## Gearbox on LH side



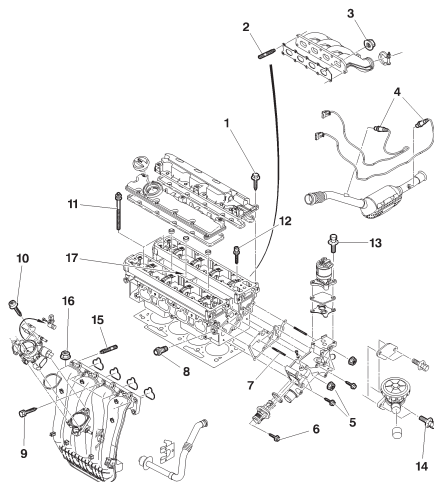
B1BP35VD

7	$1 \pm 0,1$
8	$5 \pm 0,5$
9	$6,5 \pm 0,6$
10	$3 \pm 0,3$
11	$3 \pm 0,3$
12	$6 \pm 0,6$
13	$1,9 \pm 0,2$



# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: RFN



B1BP34MP

## Cylinder head

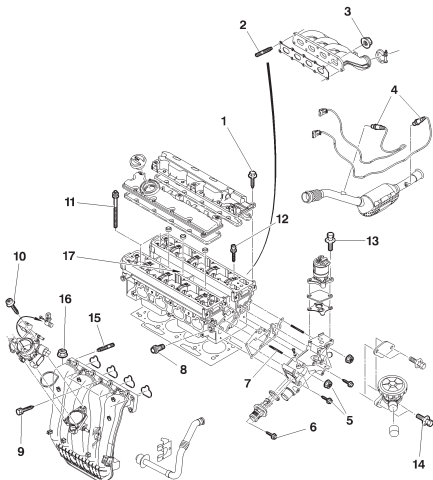
1	<b>Valve cover screws (*)</b> Pre-tightening Tightening	0,5 1,1 ± 0,1
2	<b>Exhaust manifold stud</b>	0,7 ± 0,1
3	<b>Exhaust manifold nuts</b> Tightening on heat shield Tightening apart from on heat shield	2,5 ± 0,2 3,5 ± 0,3
4	<b>Oxygen sensor</b>	4,7 ± 0,5
5	<b>Coolant outlet housing fixing (BSE)</b> Tightening of the nuts Tightening of the screws	1 ± 0,2 1 ± 0,1
6	<b>Thermostat fixing screw</b>	0,8 ± 0,1
7	<b>Coolant outlet housing fixing stud (BSE)</b>	0,3 ± 0,1
8	<b>Engine coolant temperature sensor</b>	1,7 ± 0,1
9	<b>Inlet manifold screws</b>	2,2 ± 0,4
10	<b>Motorised butterfly housing fixing screws</b>	0,8 ± 0,1

(\*) = IMPERATIVE: Respect the tightening sequence (see following page).

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: RFN

## Cylinder head



B1BP34MP

11	<b>Cylinder head bolts (*)</b>	
	1st pre-tightening	$1,5 \pm 0,1$
	2nd pre-tightening	$5 \pm 0,5$
	Angular tightening	$360^\circ$
	Tightening	$2 \pm 0,2$
	Angular tightening	$285^\circ \pm 5^\circ$
12	<b>Camshaft bearing cap cover screws (*)</b>	
	Pre-tightening	0,5
	Tightening	$1 \pm 0,1$
13	<b>EGR valve screw</b>	$0,8 \pm 0,1$
14	<b>Valve for injection of air to the exhaust</b>	$0,8 \pm 0,2$
15	<b>Inlet manifold stud</b>	$0,8 \pm 0,1$
16	<b>Inlet manifold fixing nuts</b>	$2,2 \pm 0,5$
17	<b>Sparking plug</b>	$2,7 \pm 0,2$

(\*) = IMPERATIVE: Respect the tightening sequence (see following page).

# SPECIAL FEATURES: TIGHTENING TORQUES

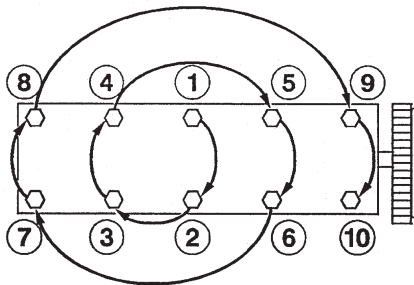
Engine: RFN

Cylinder head

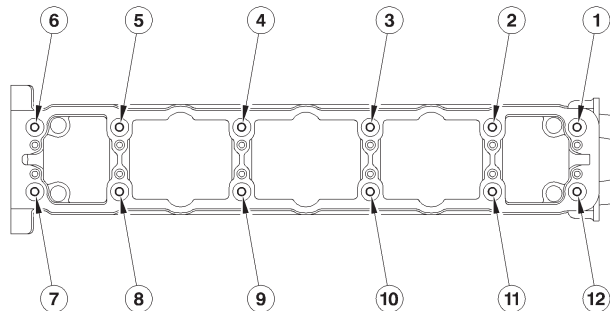
**IMPERATIVE: Respect the tightening sequence.**

- (1) Valve cover screws
- (11) Cylinder head bolts

- (12) Camshaft bearing cap screws



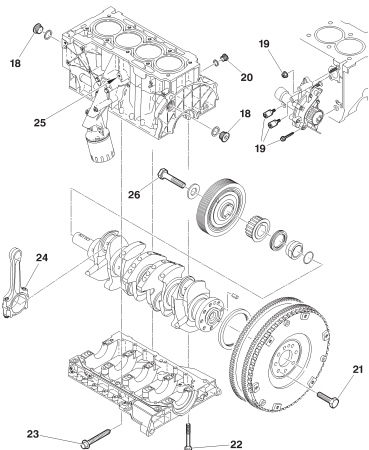
B1DP05BC



B1DP03XD

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: RFN



B1DP1KKP

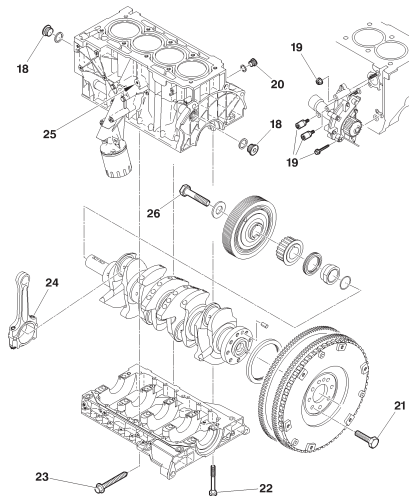
## Cylinder block

18	<b>Oil circuit plug</b>	$3 \pm 0,3$
19	<b>Coolant pump screw (*)</b> Pre-tightening Tightening	$0,8$ $1,4 \pm 1$
20	<b>Cooling circuit plug</b>	$3 \pm 0,7$
21	<b>Flywheel screw (*)</b> Pre-tightening Tightening Angular tightening	$0,8 \pm 0,1$ $2 \pm 0,2$ $23^\circ \pm 5^\circ$
22	<b>Crankshaft bearing cap cover screw (*)</b> Pre-tightening Tightening Angular tightening	$1 \pm 0,1$ $2 \pm 0,1$ $60^\circ \pm 5^\circ$

(\*) = IMPERATIVE: Respect the tightening sequence (see following page).

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: RFN



B1DP1KKP

## Cylinder block

23	<b>Crankshaft bearing cap sealing screw</b>	$1 \pm 0,1$
24	<b>Con rod cap screw (*)</b> Pre-tightening Tightening Angular tightening	1 $2,3 \pm 0,1$ $46^\circ \pm 3^\circ$
25	<b>Knock sensor</b>	$2 \pm 0,5$
26	<b>Accessories drive belt pulley screw</b> Tightening Angular tightening	$4 \pm 0,4$ $53^\circ \pm 5^\circ$

(\*) = IMPERATIVE: Respect the tightening sequence (see following page).

# **SPECIAL FEATURES: TIGHTENING TORQUES**

Engine: RFN

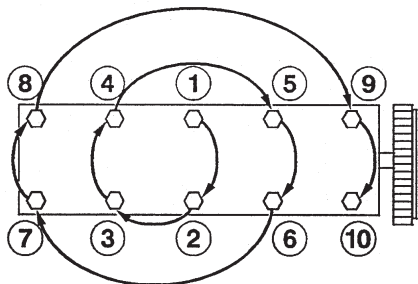
Cylinder head

**IMPERATIVE: Respect the tightening sequence.**

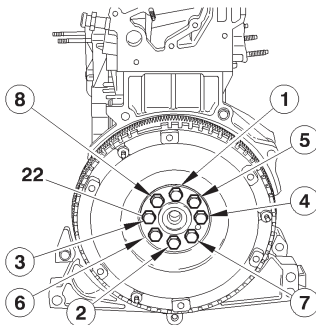
(22) Crankshaft bearing cap screws  
(24) Con rod cap screws

(21) Flywheel screws

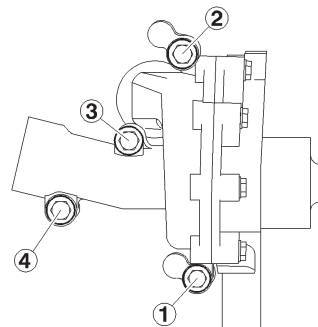
(19) Coolant pump screws



B1DP05BC



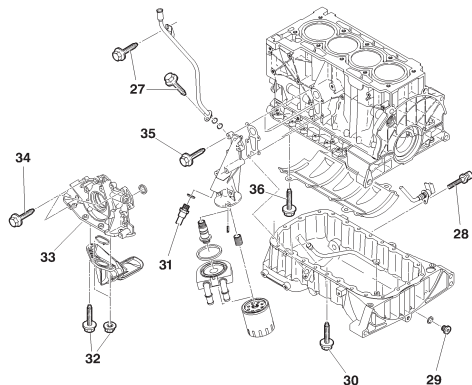
B1CP0GCC



B1GP08WC

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: RFN



B1BP34NP

## Lubrication

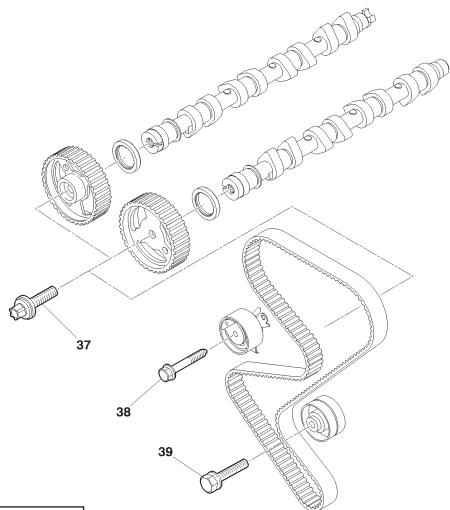
27	Oil gauge screw	$1 \pm 0,2$
28	Oil level sensor fixing screw	$1 \pm 0,2$
29	Drain plug	$3,4 \pm 0,3$
30	Oil sump screw	$0,8 \pm 0,1$
31	Oil pressure switch	$2 \pm 0,2$
32	Oil strainer fixing nuts	$1,1 \pm 0,1$
33	Oil strainer stud	$0,6 \pm 0,1$
34	Oil pump screw	0,7
	Pre-tightening	$1 \pm 0,1$
	Tightening	
35	Oil filter support screw	$0,8 \pm 0,2$
36	Anti-emulsion plate fixing screw	$1,9 \pm 0,3$

# **SPECIAL FEATURES: TIGHTENING TORQUES**

Engine: RFN

## **Timing**

<b>37</b>	<b>Camshaft pulley screw</b>	<b>7,5 ± 0,5</b>
<b>38</b>	<b>Tensioner roller screw</b>	<b>2 ± 0,3</b>
<b>39</b>	<b>Guide roller screw</b>	<b>3,5 ± 0,5</b>

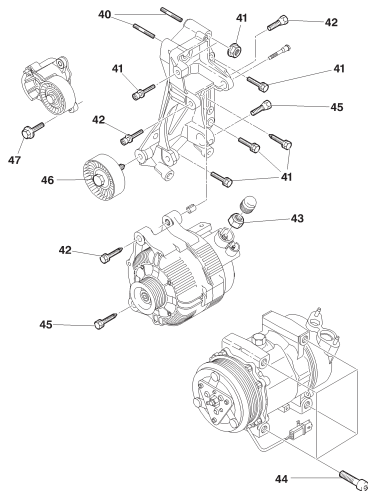


**B1EP1G6P**



# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: RFN



B1BP34PP

## Accessories

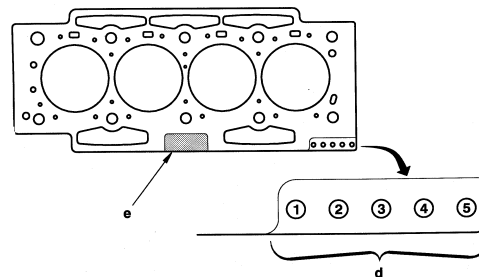
40	Accessories support fixing stud	0,8 ± 0,1
41	Accessories support fixings	
	Pre-tightening	1 ± 0,1
	Tightening	1,9 ± 0,2
42	Alternator top fixing screw	4,1 ± 0,5
43	Alternator power circuit fixing nuts	1,7 ± 0,2
44	Aircon compressor fixing screw	2,3 ± 0,3
45	Alternator bottom fixing screw	4,9 ± 0,5
46	Screw for fixing the guide roller for the accessories drive belt	
	Pre-tightening	1,5 ± 0,1
	Tightening	3,5 ± 0,4
47	Screw for fixing the automatic tensioner roller for the accessories drive belt	2 ± 0,2

# CYLINDER HEAD

Engine: RFN

## Identification of cylinder head gasket

	Nominal dimension	Repair dimension	
Identification zone "d"	4-5	2-4-5	
Marking zone "e"		R1	R2
Gasket thickness (mm)	0,8	1,1	1,4
Supplier	MEILLOR		



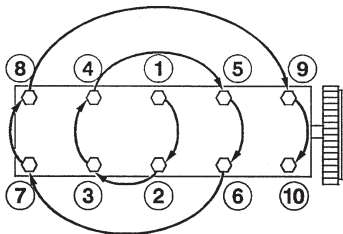
**NOTA :** Multilayer metallic gasket.

B1DP183D

# CYLINDER HEAD (continued)

Engine: RFN

## Cylinder head tightening (m.daN)

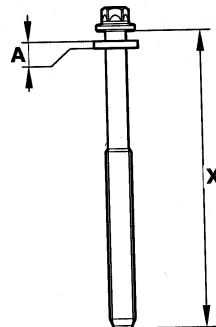


Pre-tightening	: $1,5 \pm 0,1$
Tightening	: $5 \pm 0,1$
Slackening	: $360^\circ \pm 2^\circ$
Tightening	: $2 \pm 0,75$
Angular tightening	: $285^\circ \pm 5^\circ$

**NOTA** : Oil the threads and under the heads of the bolts (*use engine oil or Molykote G Rapid Plus*).

B1DP05BC

## Cylinder head bolts



A = Thickness of the washer :  $4 \pm 0,2$

B1DP16FC

X = MAXIMUM reusable length

RFN

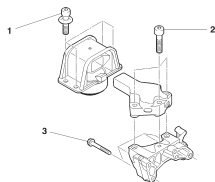
X = 147 mm

# SPECIAL FEATURES: TIGHTENING TORQUES

Suspensions for engine/gearbox assembly

Engine: RFK

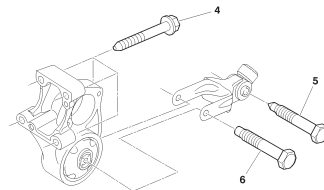
## Gearbox on RH side



B1BP35TD

1	$6 \pm 0,6$
2	$6 \pm 0,6$
3	$4,5 \pm 0,4$

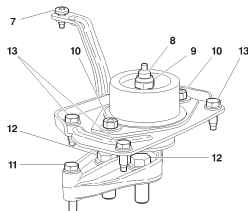
## Gearbox at torque reaction rod



B1BP35UD

4	$4,5 \pm 0,4$
5	$3,9 \pm 0,4$
6	$5,4 \pm 0,6$

## Gearbox on LH side

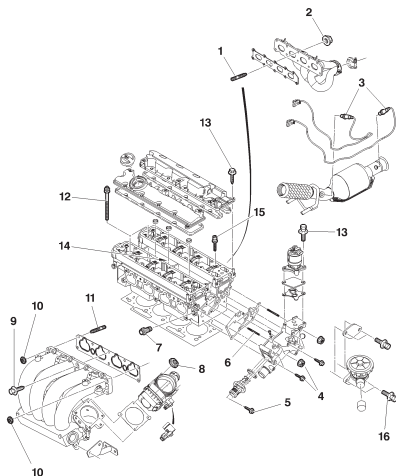


B1BP35VD

7	$1 \pm 0,1$
8	$5 \pm 0,5$
9	$6,5 \pm 0,6$
10	$3 \pm 0,3$
11	$3 \pm 0,3$
12	$6 \pm 0,6$
13	$1,9 \pm 0,2$

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: RFK



B1BP35QP

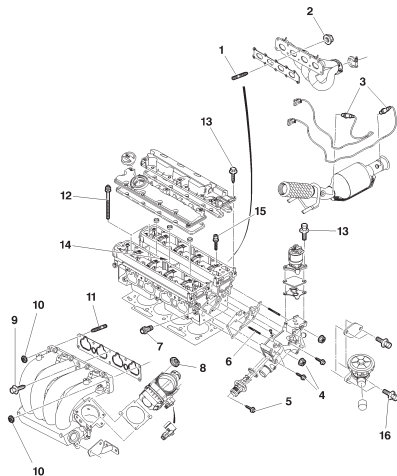
## Cylinder head

1	<b>Exhaust manifold stud</b>	<b>0,7 ± 0,1</b>
2	<b>Exhaust manifold nuts</b>	
	Tightening on heat shield Tightening apart from on heat shield	<b>2,5 ± 0,2</b> <b>3,5 ± 0,3</b>
3	<b>Oxygen sensor</b>	<b>4,7 ± 0,5</b>
4	<b>Coolant outlet housing fixing</b>	
	Tightening of the nuts Tightening of the screws	<b>1 ± 0,2</b> <b>1 ± 0,1</b>
5	<b>Thermostat fixing screw</b>	<b>0,8 ± 0,1</b>
6	<b>Coolant outlet housing fixing stud (BSE)</b>	<b>0,3 ± 0,1</b>
7	<b>Engine coolant temperature sensor</b>	<b>1,7 ± 0,1</b>
8	<b>Motorised butterfly housing fixing screws</b>	<b>0,8 ± 0,1</b>
9	<b>Inlet manifold screws</b>	<b>2,2 ± 0,4</b>
10	<b>Inlet manifold fixing nuts</b>	<b>2,2 ± 0,5</b>
11	<b>Inlet manifold stud</b>	<b>0,8 ± 0,1</b>

(\*) = IMPERATIVE: Respect the tightening sequence (see following page).

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: RFK



B1BP35QP

## Cylinder head

12	<b>Cylinder head bolts (*)</b>	
	Pre-tightening 1	$1,5 \pm 0,1$
	Pre-tightening 2	$5 \pm 0,5$
	Angular slackening	$360^\circ$
	Tightening	$2 \pm 0,2$
13	Angular tightening	$285^\circ \pm 5^\circ$
13	<b>Valve cover screws (*)</b>	
	Pre-tightening	0,5
14	Tightening	$1,1 \pm 0,1$
14	<b>Sparking plug</b>	$2,7 \pm 0,2$
15	<b>Camshaft bearing cap cover screws (*)</b>	
	Pre-tightening	0,5
15	Tightening	$1,1 \pm 0,1$
16	<b>Valve for injection of air to the exhaust</b>	$0,9 \pm 0,2$

(\*) = IMPERATIVE: Respect the tightening sequence (see following page).

# SPECIAL FEATURES: TIGHTENING TORQUES

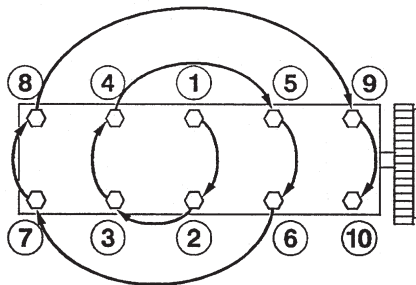
Engine: RFK

Cylinder head

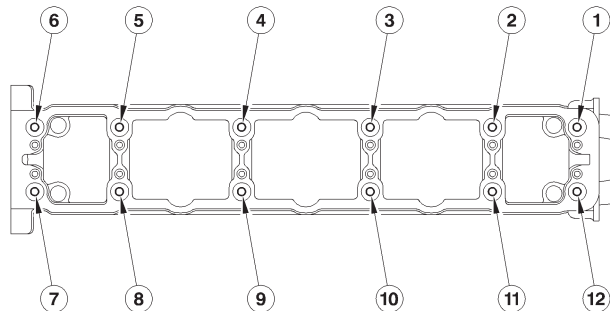
**IMPERATIVE: Respect the tightening sequence.**

- (12) Valve cover screws
- (13) Cylinder head bolts

- (15) Camshaft bearing cap screws



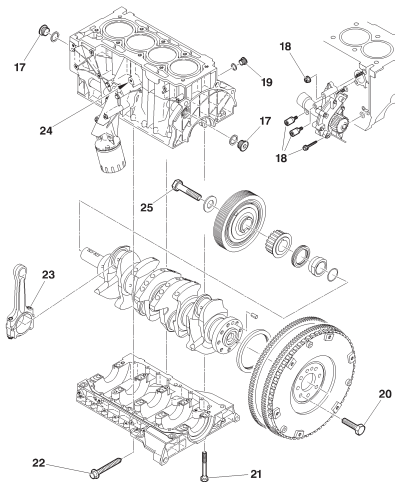
B1DP05BC



B1DP03XD

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: RFK



B1DP1KTP

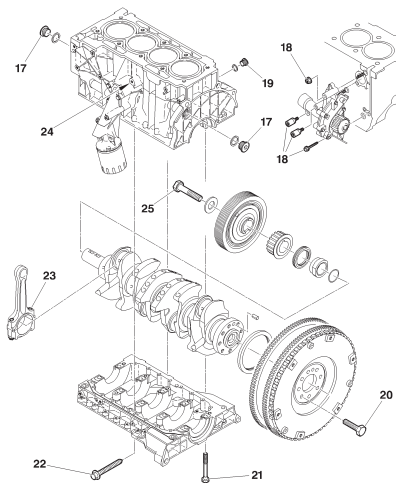
Cylinder block		
17	Oil circuit plug	$3 \pm 0,3$
18	Coolant pump screw (*)	
	Pre-tightening	0,8
	Tightening	$1,4 \pm 1$
19	Cooling circuit plug	$3 \pm 0,7$
20	Flywheel screw (*)	
	Pre-tightening	$0,8 \pm 0,1$
	Tightening	$2 \pm 0,2$
	Angular tightening	$23^\circ \pm 5^\circ$
21	Crankshaft bearing cap cover screw (*)	
	Pre-tightening	$1 \pm 0,1$
	Tightening	$2 \pm 0,1$
	Angular tightening	$60^\circ \pm 5^\circ$

(\*) = IMPERATIVE: Respect the tightening sequence (see following page).



# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: RFK



B1DP1KTP

## Cylinder block

22	<b>Crankshaft bearing cap sealing screw</b>	$1 \pm 0,1$
23	<b>Con rod cap screw (*)</b> Pre-tightening Tightening Angular tightening	1 $2,3 \pm 0,1$ $46^\circ \pm 3^\circ$
24	<b>Knock sensor</b>	$2 \pm 0,5$
25	<b>Accessories drive belt pulley screw</b> Tightening Angular tightening	$4 \pm 0,4$ $80^\circ \pm 5^\circ$

(\*) = IMPERATIVE: Respect the tightening sequence (see following page).

# **SPECIAL FEATURES: TIGHTENING TORQUES**

Engine: RFK

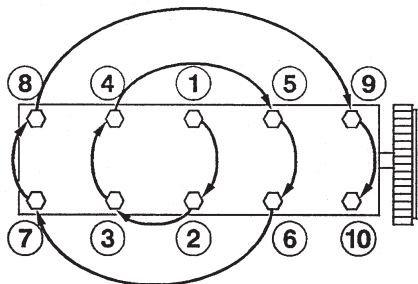
Cylinder head

**IMPERATIVE: Respect the tightening sequence.**

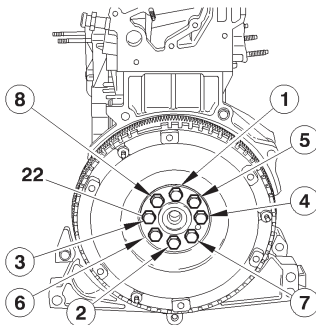
(21) Crankshaft bearing cap screws  
(23) Con rod cap screws

(20) Flywheel screws

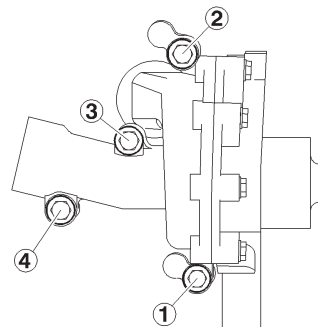
(18) Coolant pump screws



B1DP05BC



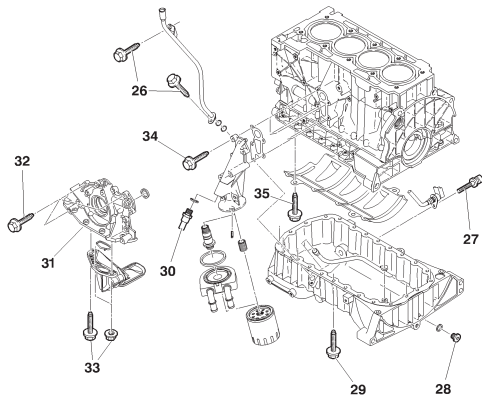
B1CP0GCC



B1GP08WC

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: RFK



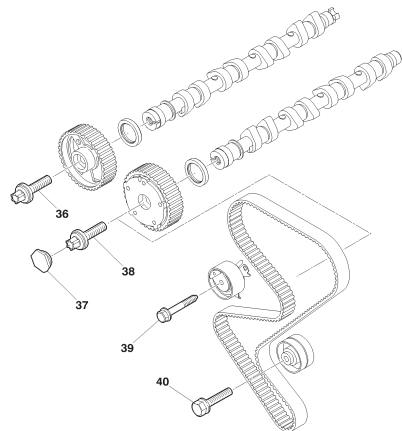
B1BP35RP

## Lubrication

26	Oil gauge screw	$1 \pm 0,2$
27	Oil level sensor fixing screw	$1 \pm 0,2$
28	Drain plug	$3,4 \pm 0,3$
29	Oil sump screw	$0,8 \pm 0,1$
30	Oil pressure switch	$2 \pm 0,2$
31	Oil strainer stud	$0,6 \pm 0,1$
32	Oil pump screw	0,7
	Pre-tightening	$1 \pm 0,1$
33	Oil strainer fixing nuts	$1,1 \pm 0,1$
34	Oil filter support screw	$0,8 \pm 0,2$
35	Anti-emulsion plate fixing screw	$1,9 \pm 0,3$

# **SPECIAL FEATURES: TIGHTENING TORQUES**

Engine: RFK



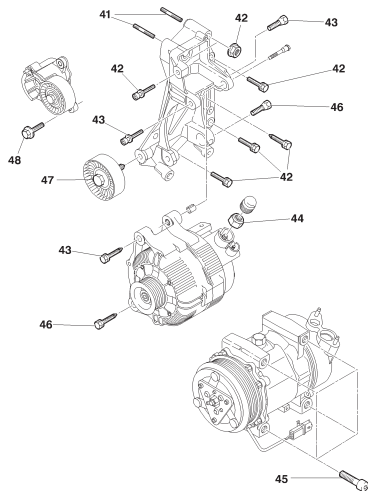
B1EP1GKP

## **Timing**

<b>36</b>	<b>Camshaft pulley screw</b>	<b>7,5 ± 0,5</b>
<b>37</b>	<b>Camshaft dephaser cap (VVT)</b>	<b>3,2 ± 0,3</b>
<b>38</b>	<b>Inlet camshaft pulley screw</b> Pre-tightening Tightening	<b>2 ± 0,2</b> <b>11 ± 1</b>
<b>39</b>	<b>Tensioner roller screw</b>	<b>2,1 ± 0,2</b>
<b>40</b>	<b>Guide roller screw</b>	<b>3,5 ± 0,5</b>

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: RFK



B1BP35SP

## Accessories

41	Accessories support fixing stud	$0,8 \pm 0,1$
42	Accessories support fixings	
	Pre-tightening	$1 \pm 0,1$
	Tightening	$1,9 \pm 0,2$
43	Alternator top fixing screw	$4,1 \pm 0,5$
44	Alternator power circuit fixing nut	$1,6 \pm 0,2$
45	Aircon compressor fixing screw	$2,4 \pm 0,3$
46	Alternator bottom fixing screw	$4,9 \pm 0,5$
47	Screw for fixing the guide roller for the accessories drive belt	
	Pre-tightening	$1,5 \pm 0,1$
	Tightening	$3,5 \pm 0,4$
48	Screw for fixing the automatic tensioner roller for the accessories drive belt	$2 \pm 0,2$

# CYLINDER HEAD

Engine: RFK

## Identification of cylinder head gasket

Supplier **MEILLOR**

Thickness

$0,80 \pm 0,04$  mm

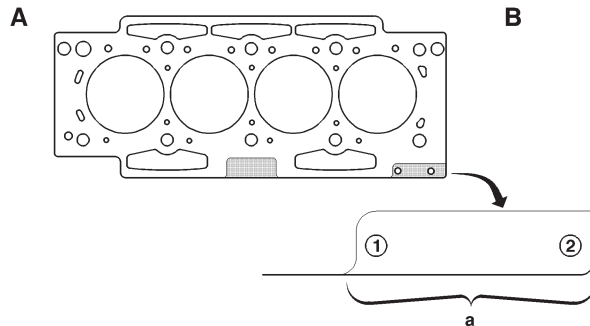
Multi-layer metallic gasket

**A** : Timing end

**B** : Clutch end

**C** : Identification zone

**D** : Marking zone

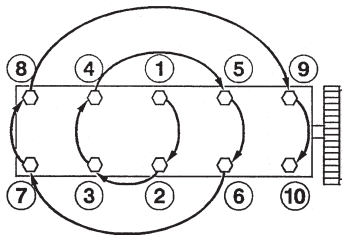


B1DP1LQD

# CYLINDER HEAD

Engine: RFK

## Cylinder head tightening (m.daN)



**NOTE:** Retightening of the cylinder head after a completed repair is prohibited.

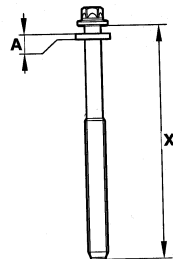
B1DP05BC

Pre-tightening :  $1,5 \pm 0,1$   
 Tightening :  $5 \pm 0,1$   
 Slackening :  $360^\circ \pm 2^\circ$   
 Tightening :  $2 \pm 0,75$   
 Angular tightening :  $285^\circ \pm 5^\circ$

(Sequence from 1 to 10)

**NOTE:** Oil the threads and under the heads of the bolts (*use engine oil or Molykote G Rapid Plus*).

## Cylinder head bolts



A = Washer thickness :  $4 \pm 0,2$  mm

B1DP16FC

X = MAXIMUM reusable length

RFK

X =  $144,5 \pm 0,5$  mm

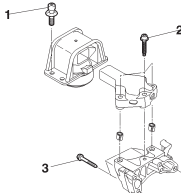
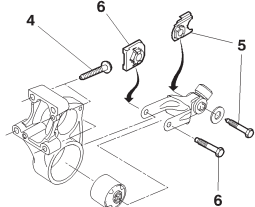
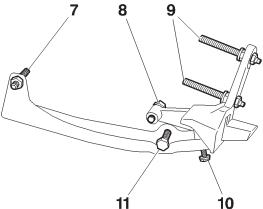
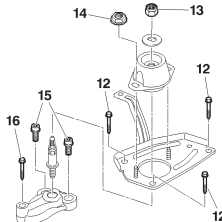
**Cleaning to be carried out just prior to refitting.**

**WARNING:** Clean the contact faces with the approved cleaning product. Do not use abrasives or cutting tools on the contact faces. The contact faces must not bear any traces of impact or scratching.  
 Brush the threads of the cylinder head bolts.

# **SPECIAL FEATURES: TIGHTENING TORQUES**

Suspensions for engine/gearbox assembly

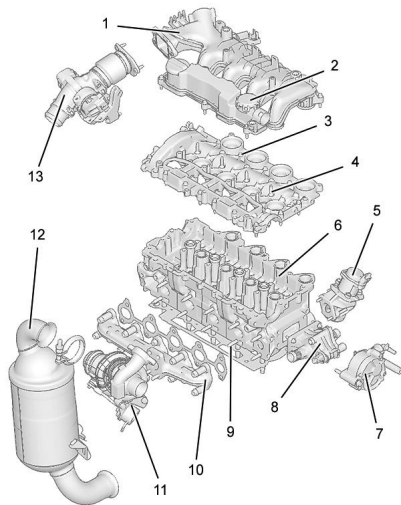
Engines: 9HX - 9HY - 9HZ

RH engine support			Torque reaction rod		
	1	6 ± 0,6		4	6 ± 0,6
	2	5,5 ± 0,5		5	3,9 ± 0,4
	3	6 ± 0,6		6	5,4 ± 0,8
B1BP38CC			B1BP38DC		
Impact absorber			LH engine support on gearbox		
	7	4 ± 0,4		12	2 ± 0,3
	8			13	6,5 ± 0,6
	9			14	3 ± 0,3
	10			15	6 ± 0,6
	11			16	2 ± 0,2
B1BP38EC			B1BP38FC		



# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: 9HX



B1BP39YP

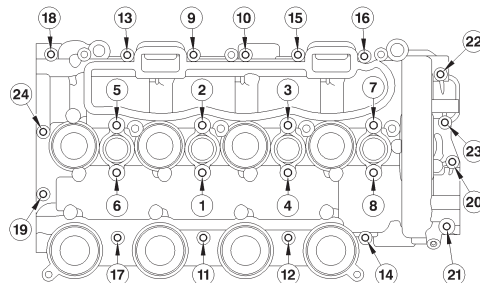
B1DP1D7D

## Cylinder head

1	Air inlet manifold	$1 \pm 0,1$
2	Oil trap	$1 \pm 0,1$
3	Camshaft bearing covers	$0,5 \pm 0,1$
	Pre-tightening	$1 \pm 0,1$
	Tightening	$1 \pm 0,1$

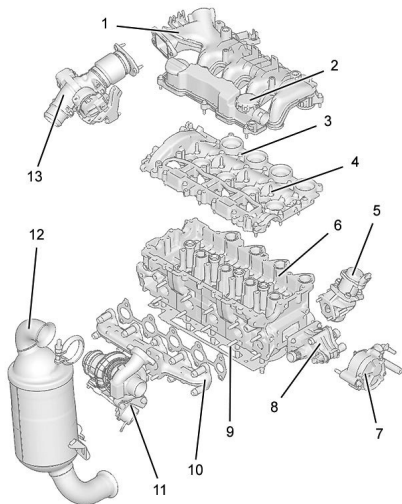
(3) Camshaft bearing cover screws

(4) Camshaft bearing cover studs



# SPECIAL FEATURES: TIGHTENING TORQUES

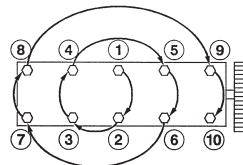
Engine: 9HX



B1BP39YP

Cylinder head		
4	<b>Camshaft bearing cover studs</b>	
	Pre-tightening Tightening	$0,5 \pm 0,1$ $1 \pm 0,1$
5	<b>Exhaust gas recycling electrovalve (EGR)</b>	$1 \pm 0,1$
6	<b>Cylinder head</b>	
	Pre-tightening Tightening Angular tightening	$2 \pm 0,2$ $4 \pm 0,5$ $260^\circ \pm 5^\circ$
7	<b>Vacuum pump</b>	$1,8 \pm 0,2$
8	<b>Coolant outlet housing</b>	
	Pre-tightening Tightening	$0,3 \pm 0,1$ $0,7 \pm 0,1$

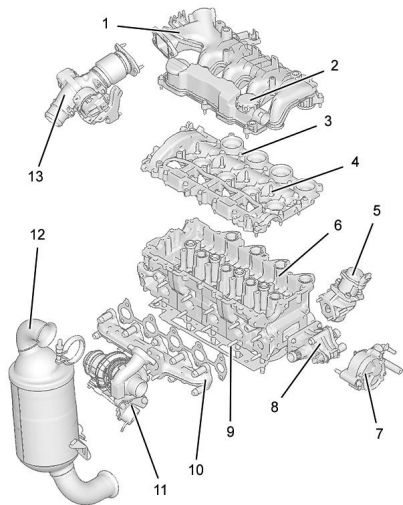
(6) Sequence for tightening the cylinder head bolts



B1DP05BC

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: 9HX



B1BP39YP

## Cylinder head

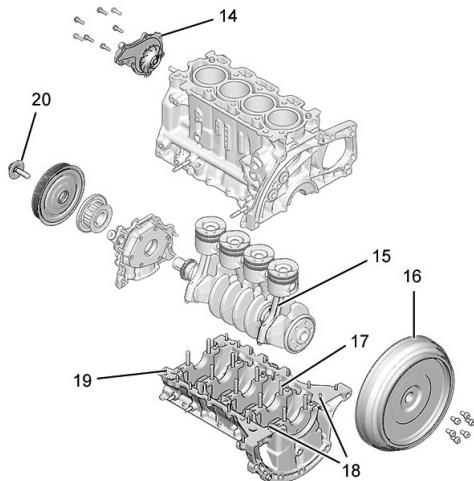
9	Exhaust manifold	$2,5 \pm 0,2$
10	Exhaust manifold stud	$1 \pm 0,2$
11	Turbocompressor nuts	$2,6 \pm 0,6$
12	Catalytic converter nuts	$2 \pm 0,1$
13	Air flowmeter Pre-tightening Tightening	0,1 $0,9 \pm 0,2$

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: 9HX

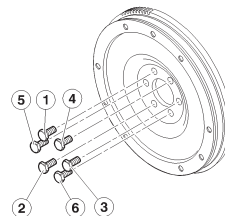
## Cylinder block

14	<b>Coolant pump</b> Pre-tightening Tightening	$0,3 \pm 0,1$ $0,9 \pm 0,1$
15	<b>Con rod screws</b> Pre-tightening Angular tightening	$1 \pm 0,1$ $100^\circ \pm 5^\circ$
16	<b>Flywheel (according to equipment)</b> Pre-tightening Angular tightening	$1,7 \pm 0,2$ $75^\circ \pm 5^\circ$
	<b>Clutch mechanism</b>	$2 \pm 0,2$



B1DP1LKP

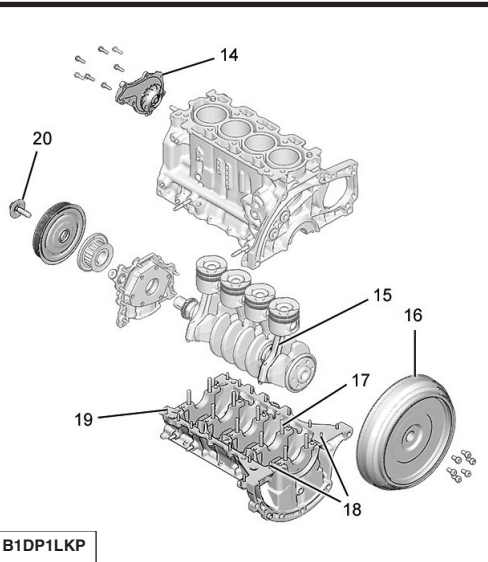
16) Sequence for tightening the flywheel screws



B1CP0GKC

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: 9HX



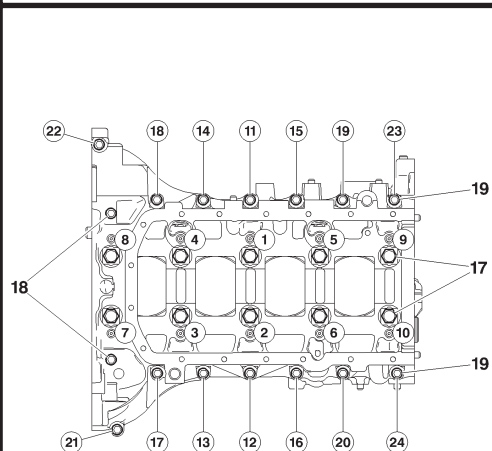
B1DP1LKP

## Cylinder block

17	<b>Bearing cap fixing screws</b>	
	Pre-tightening	$1 \pm 0,2$
	Slackening	$180^\circ$
	Tightening	$3 \pm 0,3$
18	<b>Crankshaft bearing cap cover screws</b>	
	Pre-tightening	$0,8 \pm 0,3$
	Slackening	
	Tightening	
19	<b>Crankshaft bearing cap cover screws</b>	
	Pre-tightening	$0,6 \pm 0,2$
	Slackening	
	Tightening	$0,8 \pm 0,3$
20	<b>Accessories drive pulley</b>	
	Pre-tightening	$3,5 \pm 0,4$
	Slackening	
	Angular tightening	$190^\circ \pm 5^\circ$

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: 9HX



B1DP1LLD

## Cylinder block

### Crankshaft bearing cap cover

#### Tightening method

Pre-tightening the **10 screws (17)** (from 1 to 10) to

**1**

Pre-tightening the **14 screws (19)** (from 11 to 24) to

**0,6**

Tightening the **2 screws (18)** (inside the flywheel bell housing) to

**180°**

Slacken the screws (17) by

**3**

Tightening the **10 screws (17)** (from 1 to 10) to

**140°**

Tightening the **screws (17)** (from 1 to 10) by

**0,8**

Tightening the **14 screws (19)** (from 11 to 24) to

**1**

### Sequence for tightening the screws (17), (18) and (19)

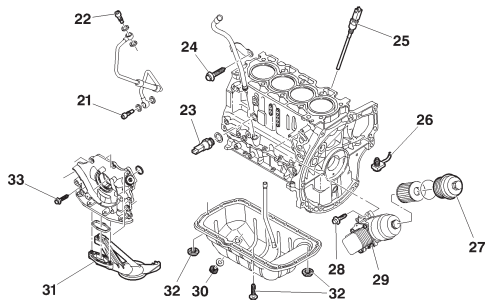
**(17)** Bearing cap fixing screws (**screw M9**)

**(18)** Crankshaft bearing cap cover screws (**screw M6**)

**(19)** Crankshaft bearing cap cover screws (**screw M6**)

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: 9HX



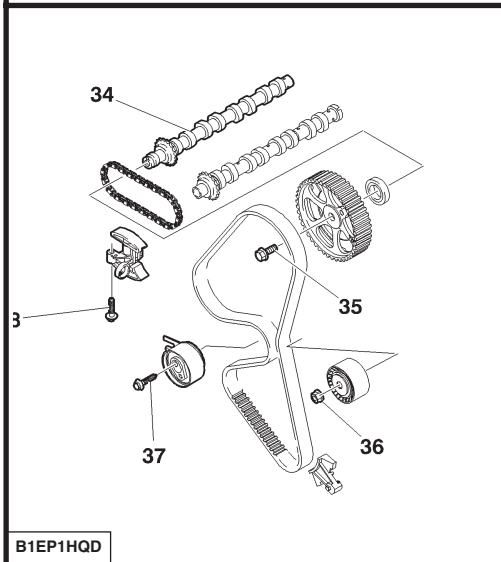
B1DP1LMD

## Lubrication

21	Turbocharger lubrication tube	3 ± 0,5
22		2,1 ± 0,3
23	Oil pressure switch	2 ± 0,2
24	Oil gauge	0,8 ± 0,2
25	Electric oil gauge	2,7 ± 0,5
26	Piston skirt spray jets	2 ± 0,5
27	Oil filter cover	2,5 ± 0,5
28	Oil filter support	1 ± 0,2
29	Coolant/oil heat exchanger	1 ± 0,1
30	Drain plug	2,5 ± 0,3
31	Oil induction strainer	1 ± 0,1
32	Oil sump	1,2 ± 0,2
33	Oil pump assembly	0,9 ± 0,1

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: 9HX



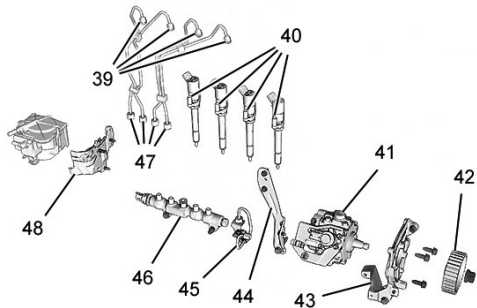
B1EP1HQD

Timing		
34	Camshaft bearing caps	$1 \pm 0,1$
35	Camshaft pulleys	
	Pre-tightening	$2 \pm 0,2$
	Angular tightening	$50^\circ \pm 5^\circ$
36	Timing belt guide roller	$3,7 \pm 0,3$
37	Timing belt tensioner roller	$2,7 \pm 0,2$
38	Timing chain tensioner	$1 \pm 0,1$



# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: 9HX



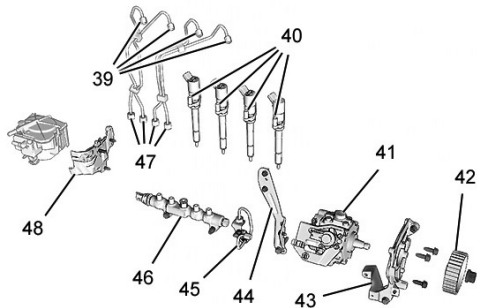
B1HP22SD

## Injection circuit

39	Union on injector	
	Pre-tightening Tightening	$2 \pm 0,5$ $2,5 \pm 0,3$
40	Injector fixing flange but	
	Pre-tightening Angular tightening	$0,5 \pm 0,5$ $65^\circ \pm 5^\circ$
41	Diesel injection pump on support	$2,2 \pm 0,3$
42	Diesel injection pump pulley	$5 \pm 0,5$
43	Diesel fuel high pressure pump front support	$2 \pm 0,5$

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: 9HX



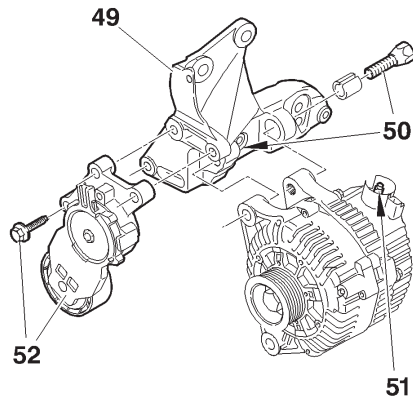
B1HP22SD

Injection circuit		
44	<b>Diesel fuel high pressure pump rear support</b>	<b><math>2 \pm 0,5</math></b>
45	<b>Union on diesel fuel high pressure pump</b>	
	Pre-tightening Tightening	$2 \pm 0,5$ $2,5 \pm 0,3$
46	<b>Fuel high pressure common injection rail on engine block</b>	<b><math>2,2 \pm 0,3</math></b>
47	<b>Unions on fuel high pressure common injection rail</b>	
	Pre-tightening Tightening	$2 \pm 0,5$ $2,5 \pm 0,3$
48	<b>Fuel filter support</b>	<b><math>0,7 \pm 0,1</math></b>

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: 9HX

Version without particle filter



D1AP02NC

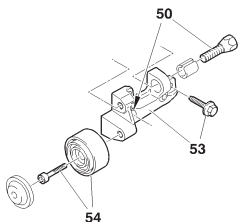
## Accessories

49	Multifunction support	$2 \pm 0,4$
50	Alternator fixing screw	$4,9 \pm 1,2$
51	Alternator power circuit fixing nut	$1,4 \pm 0,2$
52	Accessories tensioner roller	$2,1 \pm 0,2$

# **SPECIAL FEATURES: TIGHTENING TORQUES**

Engine: 9HX

## **Version without aircon**

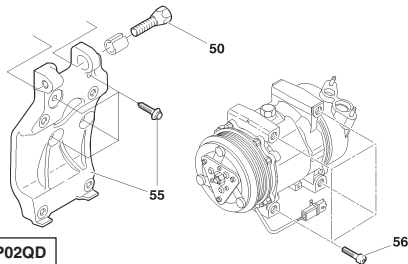


D1AP02PC

## **Accessories**

53	Accessories support	$2 \pm 0,5$
54	Guide roller	$4,5 \pm 0,5$

## **Version with aircon**



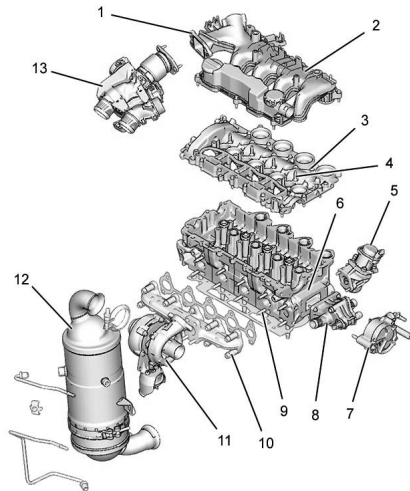
D1AP02QD

## **Accessories**

55	Aircon compressor support	$2 \pm 0,5$
56	Aircon compressor screw	$2,4 \pm 0,5$

# SPECIAL FEATURES: TIGHTENING TORQUES

Engines: 9HY - 9HZ



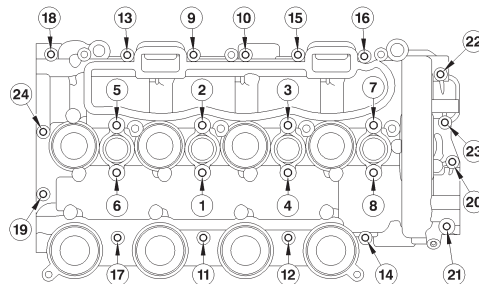
B1BP39XP

B1DP1D7D

## Cylinder head

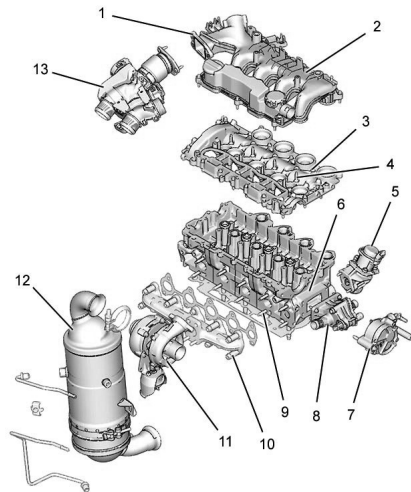
1	Air inlet manifold	$1 \pm 0,1$
2	Oil trap	$1 \pm 0,1$
3	Camshaft bearing covers screws	
	Pre-tightening	$0,5 \pm 0,1$
	Tightening	$1 \pm 0,1$

(3) Sequence for tightening the camshaft bearing cover screws



# SPECIAL FEATURES: TIGHTENING TORQUES

Engines: 9HY - 9HZ

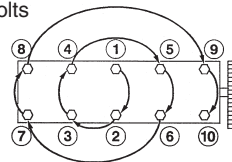


B1BP39XP

## Cylinder head

4	<b>Camshaft bearing cover studs</b>	
	Pre-tightening Tightening	$0,5 \pm 0,1$ $1 \pm 0,1$
5	<b>Exhaust gas recycling electrovalve (EGR)</b>	$1 \pm 0,1$
6	<b>Cylinder head</b>	
	Pre-tightening	$2 \pm 0,2$
	Tightening Angular tightening	$4 \pm 0,5$ $260^\circ \pm 5^\circ$
7	<b>Vacuum pump</b>	$1,8 \pm 0,2$
8	<b>Coolant outlet housing</b>	
	Pre-tightening Tightening	$0,3 \pm 0,1$ $0,7 \pm 0,1$

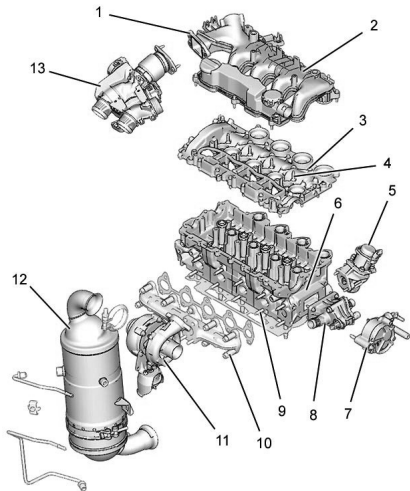
(6) Sequence for tightening the cylinder head bolts



B1DP05BC

# SPECIAL FEATURES: TIGHTENING TORQUES

Engines: 9HY - 9HZ



B1BP39XP

## Cylinder head

9	Exhaust manifold	$2,5 \pm 0,2$
10	Exhaust manifold stud	$1 \pm 0,2$
11	Turbocompressor nuts	$2,6 \pm 0,6$
12	Catalytic converter nuts	$2 \pm 0,1$
13	Double butterfly housing (according to equipment) Pre-tightening Tightening	$0,1$ $0,9 \pm 0,2$

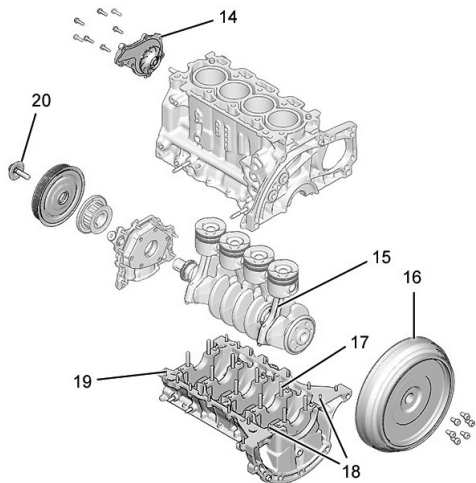
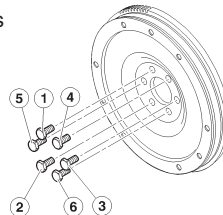
# SPECIAL FEATURES: TIGHTENING TORQUES

Engines: 9HY - 9HZ

## Cylinder block

14	<b>Coolant pump</b>	
	Pre-tightening Tightening	$0,3 \pm 0,1$ $0,9 \pm 0,1$
15	<b>Con rod screws</b>	
	Pre-tightening Angular tightening	$1 \pm 0,1$ $100^{\circ} \pm 5^{\circ}$
16	<b>Damping flywheel (according to equipment)</b>	
	Pre-tightening	$3 \pm 0,3$
	Angular tightening	$90^{\circ} \pm 5^{\circ}$
	<b>Flywheel (according to equipment)</b>	
	Pre-tightening	$1,7 \pm 0,2$
	Angular tightening	$75^{\circ} \pm 5^{\circ}$

(16) Sequence for tightening the flywheel screws



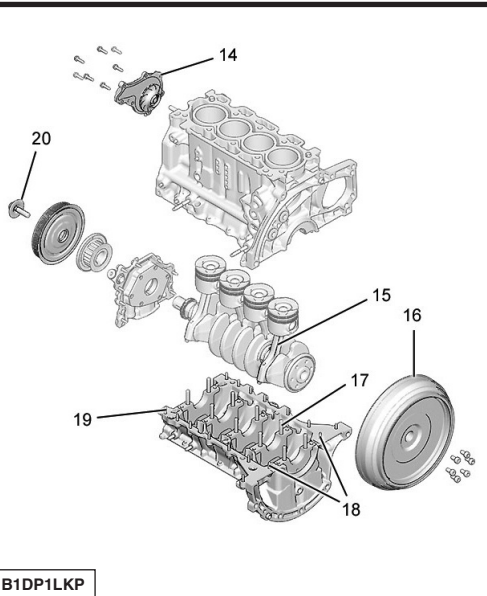
B1DP1LKP

B1CP0GKC



# SPECIAL FEATURES: TIGHTENING TORQUES

Engines: 9HY - 9HZ



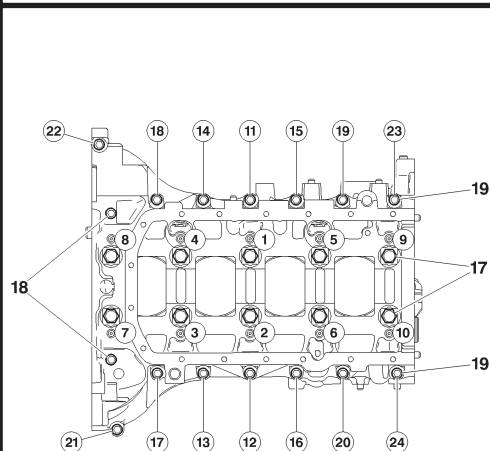
B1DP1LKP

## Cylinder block

17	<b>Bearing cap fixing screws</b>	
	Pre-tightening	$1 \pm 0,2$
	Slackening	$180^\circ$
	Tightening	$3 \pm 0,3$
18	<b>Crankshaft bearing cap cover screws</b>	
	Pre-tightening	$0,8 \pm 0,3$
	Slackening	
	Tightening	
19	<b>Crankshaft bearing cap cover screws</b>	
	Pre-tightening	$0,6 \pm 0,2$
	Slackening	
	Tightening	$0,8 \pm 0,3$
20	<b>Accessories drive pulley</b>	
	Pre-tightening	$3,5 \pm 0,4$
	Slackening	
	Tightening	$190^\circ \pm 5^\circ$

# SPECIAL FEATURES: TIGHTENING TORQUES

Engines: 9HY - 9HZ



B1DP1LLD

## Cylinder block

### Crankshaft bearing cap cover

#### Tightening method

Pre-tightening the 10 screws (17) (from 1 to 10) to	1
Pre-tightening the 14 screws (19) (from 11 to 24) to	0,6
Tightening the 2 screws (18) (inside the flywheel bell housing) to	0,8
Slacken the screws (17) by	180°
Tightening the 10 screws (17) (from 1 to 10) to	3
Tightening the screws (17) (from 1 to 10) by	140°
Tightening the 14 screws (19) (from 11 to 24) to	0,8

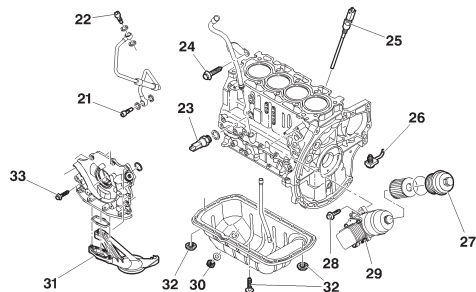
(17) Bearing cap fixing screws (screw M9)

(18) Crankshaft bearing cap cover screws (screw M6)

(19) Crankshaft bearing cap cover screws (screw M6)

# SPECIAL FEATURES: TIGHTENING TORQUES

Engines: 9HY - 9HZ



B1DP1LMD

## Lubrication

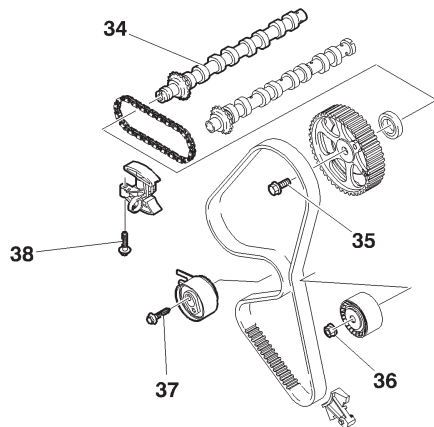
21	Turbocharger lubrication tube	3 ± 0,5
22		2,1 ± 0,3
23	Oil pressure switch	2 ± 0,2
24	Oil gauge	0,8 ± 0,2
25	Oil level sensor	2,7 ± 0,5
26	Piston skirt spray jets	2 ± 0,5
27	Oil filter cover	2,5 ± 0,5
28	Oil filter support	1 ± 0,2
29	Coolant/oil heat exchanger	1 ± 0,1
30	Drain plug	2,5 ± 0,3
31	Oil induction strainer	1 ± 0,1
32	Oil sump	1,2 ± 0,2
33	Oil pump assembly	0,9 ± 0,1

# SPECIAL FEATURES: TIGHTENING TORQUES

Engines: 9HY - 9HZ

## Timing

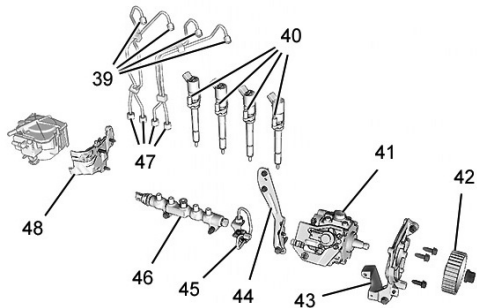
34	Camshaft bearing caps	$1 \pm 0,1$
35	Camshaft pulleys	
	Pre-tightening	$2 \pm 0,2$
	Angular tightening	$50^\circ \pm 5^\circ$
36	Timing belt guide roller	$3,7 \pm 0,3$
37	Timing belt tensioner roller	$2,7 \pm 0,2$
38	Timing chain tensioner	$1 \pm 0,1$



B1EP1HQD

# SPECIAL FEATURES: TIGHTENING TORQUES

Engines: 9HY - 9HZ



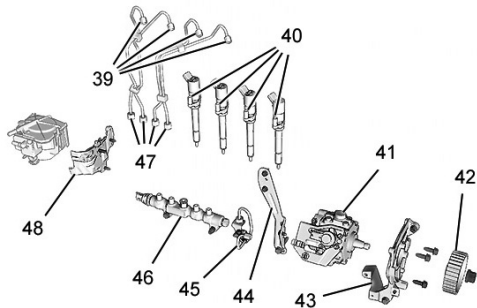
B1HP22SD

## Injection circuit

39	Union on injector	
	Pre-tightening Tightening	$2 \pm 0,5$ $2,5 \pm 0,3$
40	Injector fixing flange but	
	Pre-tightening Angular tightening	$0,5 \pm 0,5$ $65^\circ \pm 5^\circ$
41	Diesel injection pump on support	$2,2 \pm 0,3$
42	Diesel injection pump pulley	$5 \pm 0,5$
43	Diesel fuel high pressure pump front support	$2 \pm 0,5$

# SPECIAL FEATURES: TIGHTENING TORQUES

Engines: 9HY - 9HZ



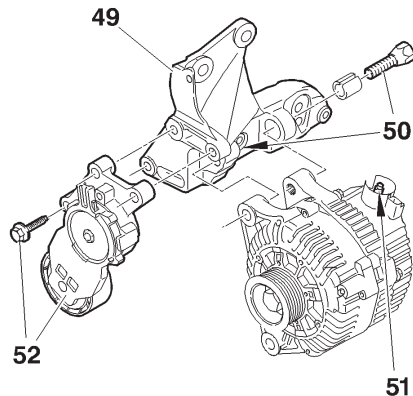
B1HP22SD

Injection circuit		
44	<b>Diesel fuel high pressure pump rear support</b>	<b>2 ± 0,5</b>
45	Union on diesel fuel high pressure pump	
	Pre-tightening Tightening	2 ± 0,5 2,5 ± 0,3
46	<b>Fuel high pressure common injection rail on engine block</b>	<b>2,2 ± 0,3</b>
47	Unions on fuel high pressure common injection rail	
	Pre-tightening Tightening	2 ± 0,5 2,5 ± 0,3
48	<b>Fuel filter support</b>	<b>0,7 ± 0,1</b>

# SPECIAL FEATURES: TIGHTENING TORQUES

Engines: 9HY - 9HZ

Version without particle filter



D1AP02NC

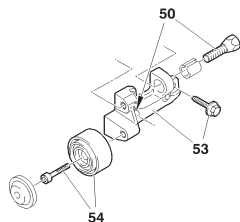
## Accessories

49	Multifunction support	$2 \pm 0,4$
50	Alternator fixing screw	$4,9 \pm 1,2$
51	Alternator power circuit fixing nuts	$1,4 \pm 0,2$
52	Accessories tensioner roller	$2,1 \pm 0,2$

# **SPECIAL FEATURES: TIGHTENING TORQUES**

Engines: 9HY - 9HZ

## **Version without aircon**

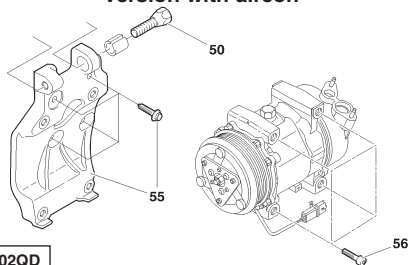


D1AP02PC

## **Accessories**

53	Accessories support	$2 \pm 0,5$
54	Guide roller	$4,5 \pm 0,5$

## **Version with aircon**



D1AP02QD

## **Accessories**

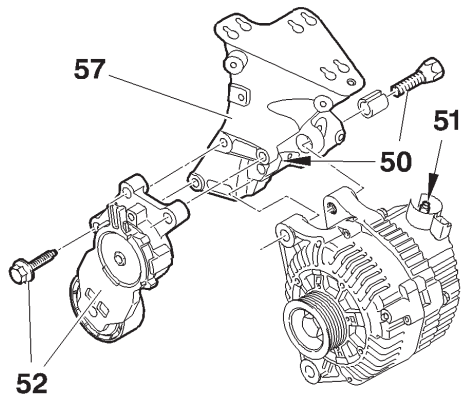
55	Aircon compressor support	$2 \pm 0,5$
56	Aircon compressor screw	$2,4 \pm 0,5$



# SPECIAL FEATURES: TIGHTENING TORQUES

Engines: 9HY - 9HZ

Version with particle filter



D1AP02RC

## Accessories

57

Multifunction support

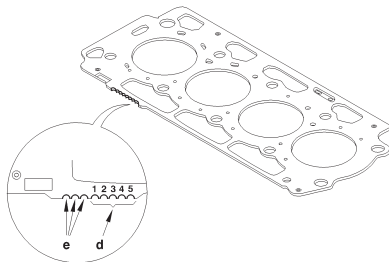
3,2 ± 0,2

# CYLINDER HEAD

Engines: 9HX - 9HY - 9HZ

## Identification of the cylinder head gasket

Engine types	Supplier	Piston standproud (mm)	thicknesses (mm)	No. of notches at d	No. of notches at e	Type of gasket: Metallic multilayer
9HX 9HY 9HZ	FEDERAL MOGUL	0,685 to 0,734	1,35	1	3	«d» Thickness reference
		0,533 to 0,634	1,25	2		«e» Engine reference
		0,635 to 0,684	1,30	3		
		0,735 to 0,784	1,40	4		
		0,785 to 0,886	1,45	5		

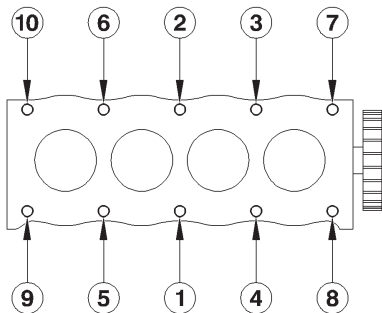


B1DP1HOD

# CYLINDER HEAD

Engines: 9HX - 9HY - 9HZ

## Cylinder head tightening (m.daN)



B1DP1CLC

(Sequence from 1 to 10)

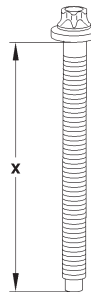
Pre-tightening :  $2 \pm 0,2$

Tightening :  $4 \pm 0,5$

Angular tightening :  $260^{\circ} \pm 5^{\circ}$

**NOTE:** Oil the threads and under the heads of the bolts (use engine oil or Molykote G Rapid Plus).

## Cylinder head bolts



B1DP1DBC

**X = MAXIMUM reusable length**

**9HX - 9HY - 9HZ**

**X = 147 mm**

**Cleaning to be carried out just prior to refitting.**

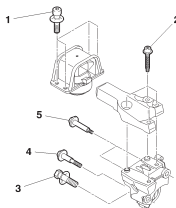
**WARNING:** Clean the contact faces with the approved cleaning product. Do not use abrasives or cutting tools on the contact faces. The contact faces must not bear any traces of impact or scratching. Insert a tap in the threads of the holes in the cylinder block receiving the cylinder head bolts (**tap 11x150**). Brush the threads of the cylinder head bolts.

# SPECIAL FEATURES: TIGHTENING TORQUES

Suspensions for engine/gearbox assembly

Engine: RHR

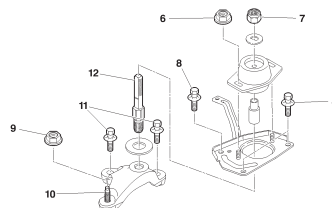
## RH engine support



B1BP35HD

1	$5,5 \pm 0,5$
2	$6 \pm 0,5$
3	$5,5 \pm 0,5$
4	
5	

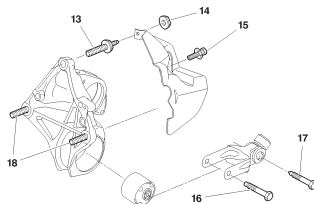
## LH engine support



B1BP35JD

6	$3 \pm 0,3$
7	$6,5 \pm 0,6$
8	$2 \pm 0,2$
9	$4,5 \pm 0,4$
10	$3 \pm 0,3$
11	$5,5 \pm 0,5$
12	$5 \pm 0,5$

## Lower engine support



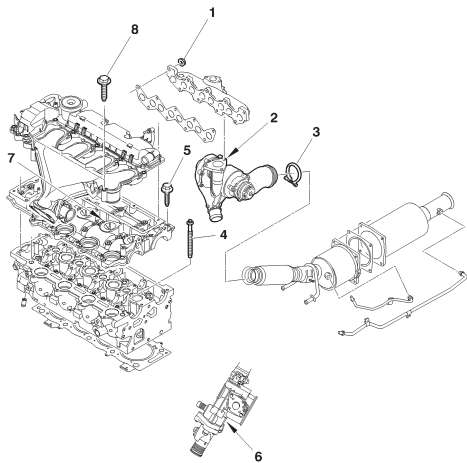
B1BP35KD

13	$6 \pm 0,6$
14	$1 \pm 0,1$
15	
16	$5,5 \pm 0,5$
17	$4 \pm 0,4$
18	$6 \pm 0,6$

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: RHR

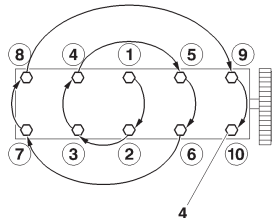
## Cylinder head



B1DP1LCP

1	<b>Exhaust manifold</b> Pre-tightening Tightening	1,5 $3 \pm 0,3$
2	<b>Turbocompressor</b>	$2,5 \pm 0,2$
3	<b>Exhaust clip</b>	$2,5 \pm 0,5$
4	<b>Cylinder head bolts (*)</b> Pre-tightening Tightening Slackening Tightening Angular tightening	$2,2 \pm 0,2$ $6 \pm 0,5$ 1 Turn $6 \pm 0,5$ $220^\circ \pm 5^\circ$

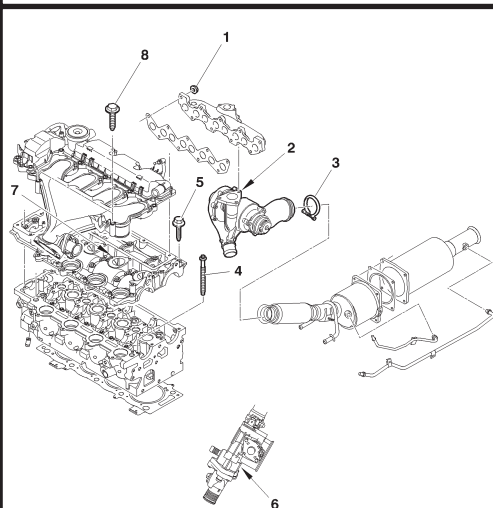
(\*) (4) Sequence of tightening



B1DP1LDC

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: RHR



B1DP1LCP

Cylinder head		
5	Camshaft bearing cap cover screws (*)	$1 \pm 0,1$
6	Coolant outlet housing fixing	$2 \pm 0,2$
7	Camshaft bearing cap cover studs (*)	
	Pre-tightening (the 26 screws Ø 6)	0,5
	Tightening (the 26 screws Ø 6)	$1 \pm 0,1$
8	Inlet valve cover screws (*) (19 screws)	$0,9 \pm 0,1$

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: RHR

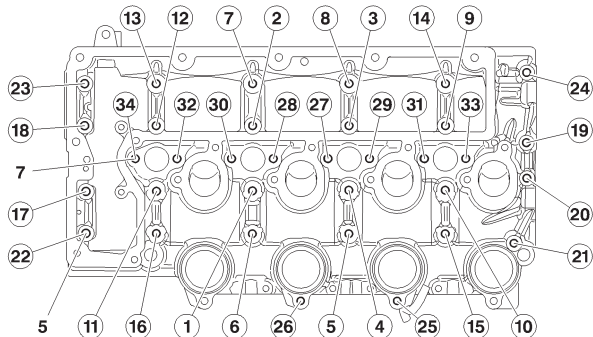
Cylinder head

(\*) Bolts (5) and (7) Sequence of tightening

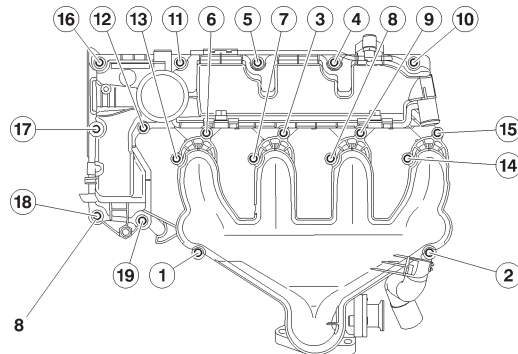
(\*) Bolts (8) Sequence of tightening

(5) Camshaft bearing cap cover screws  
(7) Camshaft bearing cap cover studs

(8) Inlet valve cover screws



B1DP1LED



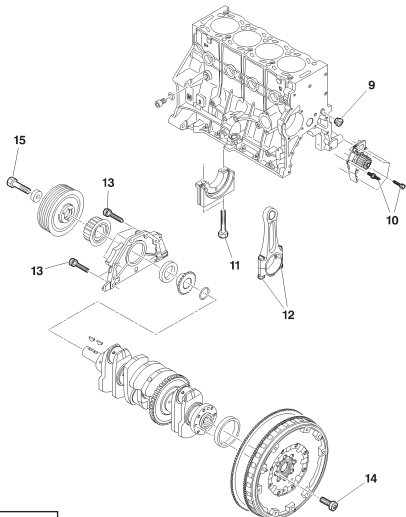
B1BP38ZD

## SPECIAL FEATURES: TIGHTENING TORQUES

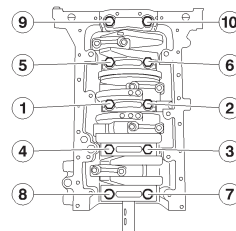
**Engine: RHR**

### Cylinder block

9	Oil circuit plug	3 ± 0,3
10	Coolant pump screw	1,6 ± 0,3
11	Crankshaft bearing cap screws (*) Pre-tightening Angular tightening	2,5 ± 0,2 60° ± 5°
12	Con rod cap nuts Tightening Slackening Tightening Angular tightening	1 180° 2,3 ± 0,1 45° ± 5°



B1CP0GNP



**B1CP0DGC**

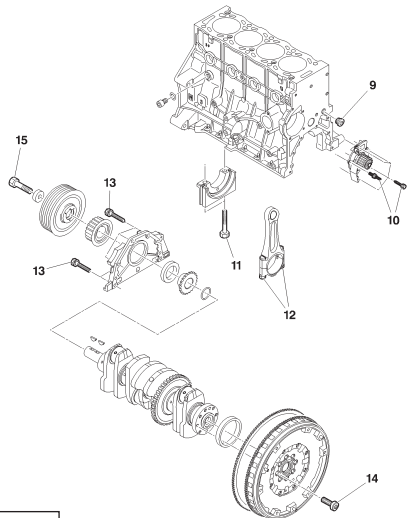
(\*) (11) Crankshaft bearing cap screws



# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: RHR

## Cylinder block

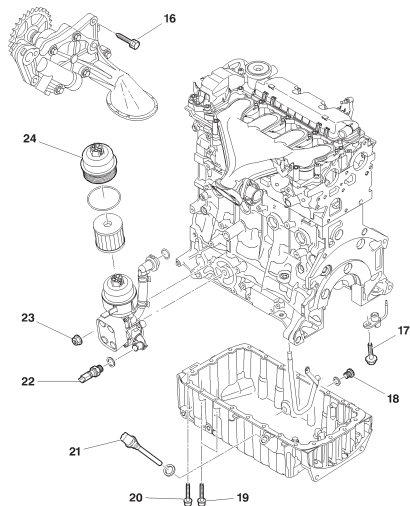


B1CP0GNP

13	Front closing plate screw	
14	Flywheel screws Pre-tightening Tightening	1,5 4,7 ± 0,4
15	Accessories drive pulley screw Pre-tightening Angular tightening	7 ± 0,25 60° ± 5°

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: RHR



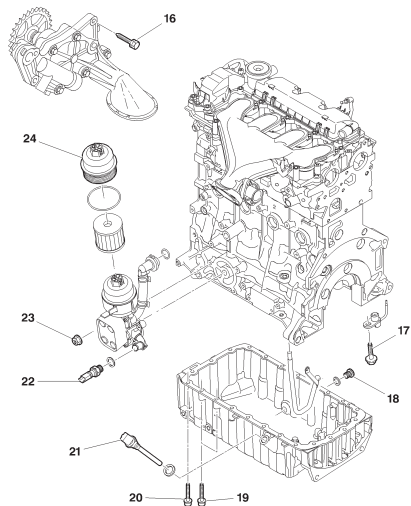
B1CP0GPP

## Lubrication

16	Oil pump screw	1,6 ± 0,1
17	Piston skirt spray jet screw	1 ± 0,1
18	Drain plug	3,4 ± 0,4
19	Oil sump (length 40 mm ) Pre-tightening Tightening	1 1,6 ± 0,3
20	Oil sump (length 21 mm) Pre-tightening Tightening	1 1,6 ± 0,3
21	Electric oil gauge	2,7 ± 0,2

# SPECIAL FEATURES: TIGHTENING TORQUES

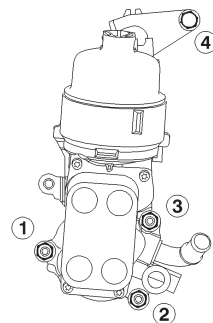
Engine: RHR



B1CP0GPP

Lubrication		
22	Oil pressure switch	$2 \pm 0,2$
23	Oil filter support (*)	
	Tightening	$1 \pm 0,1$
24	Tightening	$2 \pm 0,2$
	Oil filter cover	$2,5 \pm 0,5$

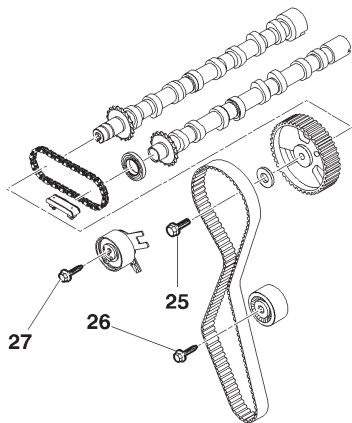
(\*) (23) Sequence of tightening



B1FP062C

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: RHR



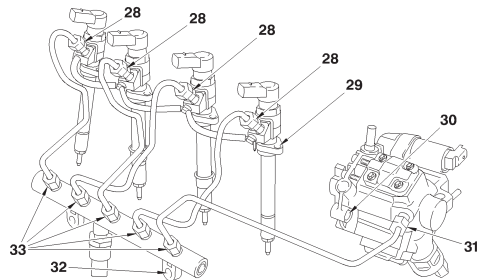
B1EP1HPD

## Timing

25	<b>Camshaft drive pulley screw</b> Tightening Angular tightening	$7 \pm 0,7$ $60^\circ \pm 5^\circ$
26	<b>Guide roller screw</b> Pre-tightening Tightening	1,5 $4,3 \pm 0,4$
27	<b>Tensioner roller screw</b>	$2,1 \pm 0,2$

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: RHR



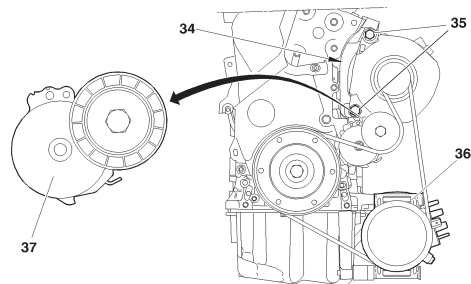
B1HP22LD

## Injection circuit

28	High pressure pipe union on injector	2,5 ± 0,2
29	Diesel injector nuts Do up both nuts by hand Tightening Angular tightening	0,4 ± 0,3 45° ± 5°
30	Fuel high pressure pump screw	2,25 ± 0,3
31	High pressure pipe union on fuel high pressure pump	2,5 ± 0,2
32	Fuel high pressure supply common rail nuts	3 ± 0,3
33	Union on fuel high pressure supply common rail	2,5 ± 0,2

# SPECIAL FEATURES: TIGHTENING TORQUES

Engine: RHR



B1BP390D

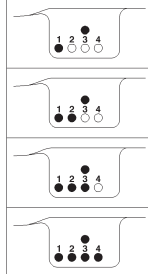
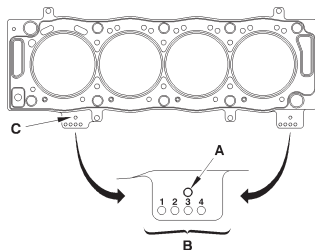
Accessories		
34	Alternator support	$2 \pm 0,2$
35	Alternator	$4,9 \pm 0,4$
36	Aircon compressor	$2,5 \pm 0,2$
37	Accessories belt tensioner roller	$4,3 \pm 0,4$

# CYLINDER HEAD

Engine: RHR

## Identification of the cylinder head gasket

Engine types	Piston standproud (mm)	thicknesses of flattened gasket (mm)	No. of holes at A	No. of holes at B	Type of gasket: Metallic multilayer
RHR	0,55 to 0,60	1,25 ± 0,04	1	1	<p>«d» Thickness reference</p> <p>«e» Engine reference</p> <p>Select the cylinder head gasket thickness as a function of the piston standproud.</p>
	0,61 to 0,65	1,30 ± 0,04		2	
	0,66 to 0,70	1,35 ± 0,04		3	
	0,71 to 0,75	1,40 ± 0,04		4	

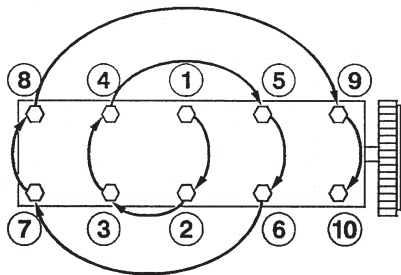


B1DP1FPD

# CYLINDER HEAD

Engine: RHR

## Cylinder head tightening (m.daN)



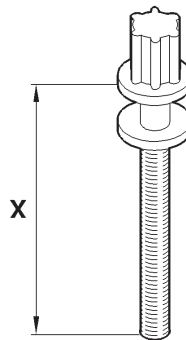
Pre-tightening	: $2 \pm 0,2$
Tightening	: $6 \pm 0,6$
Slackening	: <b>The bolts by 360°</b>
Pre-tightening	: $2 \pm 0,2$
Tightening	: $6 \pm 0,6$
Angular tightening	: $220^\circ \pm 5^\circ$

(in the sequence from 1 to 10)

### NOTE:

- The bolts should have been carefully brushed with a metal brush and then dried.
- Oil the threads and under the heads of the bolts. (Use engine oil or Molykote G Rapid Plus).
- Insert the tap into the threaded holes in the cylinder block.

## Cylinder head bolts



B1DP15EC

**X = MAXIMUM reusable length**

**RHR**

**X = 134,5 mm**

B1DP05BC



**AUXILIARY EQUIPMENT DRIVE BELT**

	ET	TU	EW			DV6			EW10
	3	5	10			ATED	TED		BTED
	J4	JP	A	J4	J4S	4			
Engine types	KFU	NFU	RFJ	RFN	RFK	9HX	9HY	9HZ	RHR
C4	X	X	X	X	X	X	X	X	X
See pages:	147 to 148		149	150	151	152 to 153			154

## AUXILIARY EQUIPMENT DRIVE BELT

Engines: KFU - NFU

### Tools.

- |  |              |
|--|--------------|
| [1] Pliers for removing plastic pegs           | : 7504-T     |
| [2] Belt tension measuring instrument (SEEM)   | : 4122-T     |
| [3] Compression lever for dynamic tensioner    | : (-).0194.D |
| [4] Peg for dynamic tensioner roller of Ø 4 mm | : (-) 0194.F |

**WARNING: (with or without air conditioning).**

The auxiliaries drive belt **cannot be re-used** with a **manual tensioner roller**.

The auxiliaries drive belt **can be re-used** with a **dynamic tensioner roller**.

### Removing.

Raise and support the vehicle, front wheels hanging.

Disconnect the battery.

Remove the front RH wheel and the front RH splash-shield, using tool [1].

### Vehicle without air conditioning.

Slacken bolts (2), screw (3) and the tensioning screw (1).

Push back the alternator towards the engine.

Remove the auxiliary equipment drive belt.

### Refitting.

Refit the new auxiliary equipment drive belt.

Respect the following sequence: Crankshaft pinion, alternator pulley.

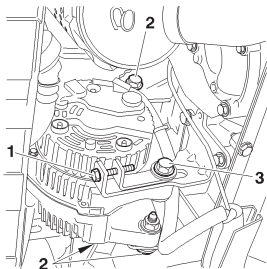
Position tool [2] on the belt.

Tighten the screw (1) to tension the belt to: **120 ± 4 SEEM units**.

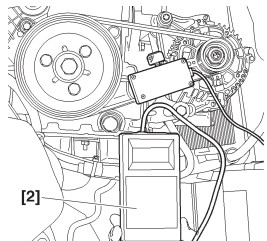
Tighten screw (3), bolts (2).

Remove tool [2].

Complete the refitting.



B1BP2LSC



B1BP2LTC

## AUXILIARY EQUIPMENT DRIVE BELT

Engine: KFU

### Vehicle with air conditioning.

#### **Removing.**

Place tool [4] at «a».

Compress the dynamic tensioner roller.

Place tool [3] at «b».

Remove the auxiliary equipment drive belt.

**IMPERATIVE:** Check that the dynamic tensioner roller turns freely (*without play and without tight spots*).

#### **Refitting.**

**NOTE:** Visually check the condition of the auxiliary equipment drive belt prior to refitting.

Place tool [4] at «a».

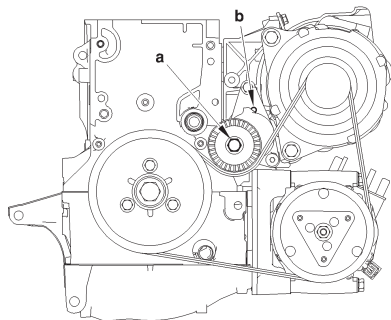
Compress the dynamic tensioner roller.

Remove tool [3].

Refit the auxiliary equipment drive belt.

Respect the following sequence:

- Crankshaft pinion, aircon compressor pulley, alternator pulley, dynamic tensioner roller.
- Remove the tools.
- Complete the refitting.



B1EP1GQD

## AUXILIARY EQUIPMENT DRIVE BELT

Engines: RFJ

Tools.

: (-).1608.E

[1] «Junior» T extension

### Removing.

Engage tool [1] in the notch «a».

Exert on the roller (1) an effort upwards to hold it at maximum.

Remove the auxiliaries drive belt.

Carefully release the tensioner roller (1) to reach its minimum.

Remove tool [1].

**IMPERATIVE:** Check that the roller (1) turns freely (*without play and without tight spots*).

### Refitting.

If removing the auxiliaries drive belt tensioner roller, tighten the screws  $2 \pm 0,2$  m.daN.

Engage tool [1] in the notch at «a».

Exert on the roller (1) an effort upwards to hold it at maximum.

Position the (*new*) auxiliaries drive belt, in the following sequence:

- Auxiliaries drive pulley (4), aircon compressor pulley (3), tensioner roller (1) and alternator pulley (2).

**IMPERATIVE:** Make sure that the auxiliaries drive belt is correctly positioned in the grooves of the various pulleys.

Release the tensioner roller (1).

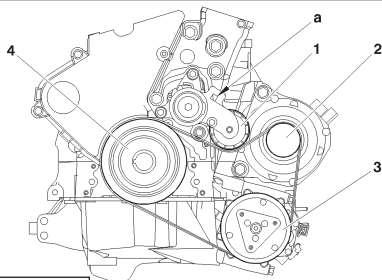
Remove tool [1].

### Checking the tension of the auxiliaries drive belt.

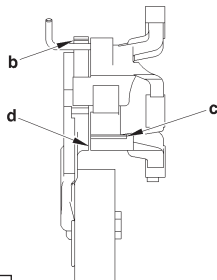
Check the tension of the auxiliaries drive belt:

- Mark «b» at the level of mark «c», new belt.

- Mark «b» at the level of mark «d», belt to be changed.



B1EP1FUD

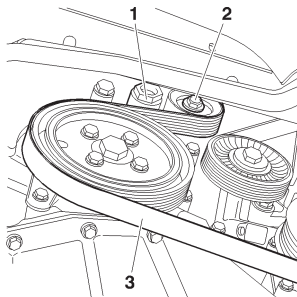


B1EP1FVC

# AUXILIARY EQUIPMENT DRIVE BELT

Engine: RFN

Without air conditioning



## Removing.

Raise and support the vehicle, wheels hanging.

Remove the front RH wheel, the plastic pins and the splash-shield.

Detension the belt (3) by turning the tensioner roller (1) by means of the screw (2) (clockwise).

**NOTE:** Screw (2) has a left hand thread.

Compress the tensioner roller (1).

Remove the auxiliaries drive belt (3).

**IMPERATIVE:** Check that the rollers (4) and (5) turn freely (without play and without tight spots).

## Refitting.

Compress the tensioner roller (1).

Fit the auxiliaries drive belt (3).

**IMPERATIVE:** Make sure that the auxiliaries drive belt is correctly positioned in the grooves of the various pulleys.

Complete the refitting.

## Tightening torques:

Tensioner roller screw (4)

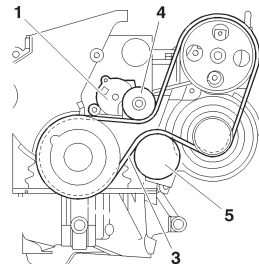
:  $2 \pm 0,2$  m.daN.

Guide roller screw (5)

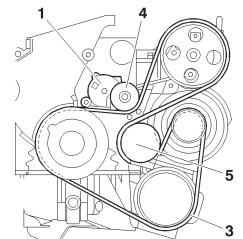
:  $3,5 \pm 0,,3$  m.daN.

Wheel bolts

:  $9 \pm 1$  m.daN.



With air conditioning



B1BP23PC

B1BP23QC

B1BP23RC

## AUXILIARY EQUIPMENT DRIVE BELT

Engine: RFK

### Tools.

[1] Detensioning lever for auxiliaries drive belt tensioner roller  
Dynamic spanner extension  
Adaptor for socket **9x12**  
Polygon socket **9x12**

:  
: **FACOM SJ.214**  
: **FACOM J.274**  
: **016**

### Removing.

Raise and support the vehicle, wheels hanging.  
Remove the front RH wheel, the plastic pins and the splash-shield.  
Turn the tensioner roller (1) by the screw (2) (*anti-clockwise*), using tool [1] to detension the belt (3).  
**NOTE:** Screw (2) has a left hand thread.  
Remove the auxiliaries drive belt (3).

### Refitting.

**IMPERATIVE:** Check that the rollers (4) and (5) turn freely (*without play and without tight spots*).

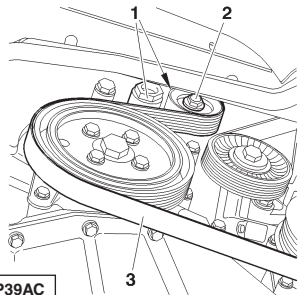
### Refitting.

Compress the tensioner roller (1), using tool [1].  
Fit the auxiliaries drive belt (3).  
**IMPERATIVE:** Make sure that the auxiliaries drive belt is correctly positioned in the grooves of the various pulleys.  
Complete the refitting.

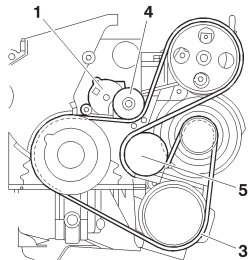
### Tightening torques:

Tensioner roller screw (4) tighten to  
Guide roller screw (5) tighten to

: **2 ± 0,2 m.daN.**  
: **3,5 ± 0,3 m.daN.**



B1BP39AC



B1BP23RC

# AUXILIARY EQUIPMENT DRIVE BELT

Engines: 9HX - 9HY - 9HZ

## Tools.

- |  |               |
|--|---------------|
| [1] Dynamic tensioner roller lever (DV6 TED4 engine)   | : (-).0194-E3 |
| [1a] Dynamic tensioner roller lever (DV6 ATED4 engine) | : (-).0194-E1 |
| [1b] Lever extension (DV6 ATED4 engine)                | : (-).0194-E2 |
| [2] Dynamic tensioner roller locking peg               | : (-).0194-F  |

**IMPERATIVE:** Respect the safety and cleanliness requirements specific to High pressure Diesel injection (HDi) engine versions.

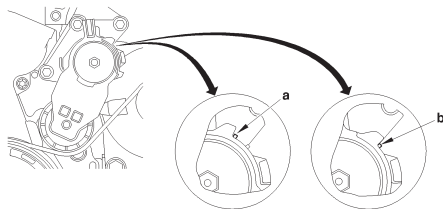
## Markings on the dynamic tensioner roller.

- «a» position «maximum wear» of the auxiliaries drive belt.  
 «b» Nominal position.

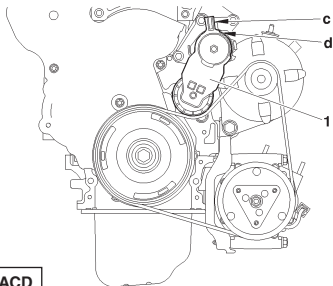
## Removing.

**WARNING:** Mark the direction of fitting of the auxiliaries drive belt in the case of re-use of the belt.

- Compress the dynamic tensioner roller (1) by acting at «c» (*clockwise*), using tool [1].  
 Peg using tool [2] at «d».  
 Keep the dynamic tensioner roller (1) compressed and remove the auxiliaries drive belt.



B1EP18UD



B1BP3ACD

## AUXILIARY EQUIPMENT DRIVE BELT

Engines: 9HX - 9HY - 9HZ

### Refitting.

**WARNING:** Belt to be re-used, mark the direction of fitting of the belt.

Refit the auxiliaries drive belt.

Compress the tensioner roller (1) by acting at «c» (clockwise), using tool [1].

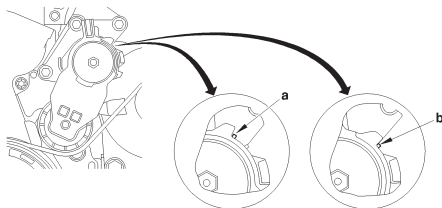
Remove tool [2].

**IMPERATIVE:** Make sure that the auxiliaries drive belt is correctly positioned in the grooves of the various pulleys.

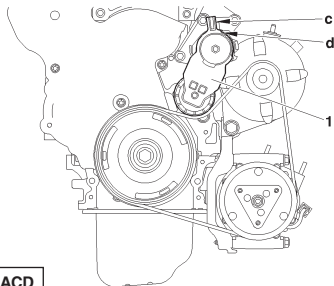
### Refit:

- The front RH wheel.
- The sound-deadening under the engine.
- Reconnect the battery.

**IMPERATIVE:** Carry out the operations that are necessary following a reconnection of the battery (see corresponding operation).



B1EP18UD



B1BP3ACD



# AUXILIARY EQUIPMENT DRIVE BELT

Engine: RHR

## Tools.

- |   |               |
|---|---------------|
| [1] Dynamic tensioner compression lever           | : (-).0188.Z  |
| [2] Dynamic tensioner roller retaining peg Ø 4 mm | : (-).0188.Q1 |

## Removing.

Remove the splash-shield, under-engine sound-deadening, front RH wheel.

**WARNING:** Mark the direction of fitting of the auxiliaries drive belt in the case of re-use of the belt.

Compress the dynamic tensioner roller (1) by acting at «b» (*anti-clockwise*), using tool [1].

Peg using tool [2] at «a».

**IMPERATIVE:** Check that the roller (1) turns freely (*without play and without tight spots*).

## Refitting.

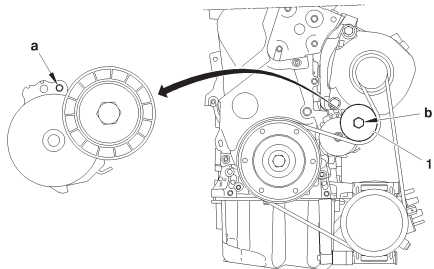
Refit the auxiliaries drive belt.

**IMPERATIVE:** Make sure that the auxiliaries drive belt is correctly positioned in the grooves of the various pulleys.

Compress the dynamic tensioner roller (1) by acting at «b», using tool [1].

Remove tool [2] at «a».

Complete the refitting.



B1BP31AD

## CHECKING AND SETTING THE VALVE TIMING

	ET	TU	EW			DV6			EW10
	3	5	10			ATED	TED		BTED
	J4	JP	A	J4	J4S	4			
Engine types	KFU	NFU	RFJ	RFN	RFK	9HX	9HY	9HZ	RHR
C4	X	X	X	X	X	X	X	X	X
See pages:	158 to 162	163 to 168	169 to 175	176 to 182	183 to 190	191 to 199			200 to 207

# BELT TENSION CORRESPONDANCE TABLE / SEEM UNITS






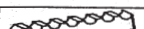



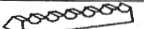



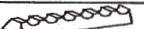



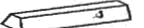











↓ 4099-T (C.TRONIC.105)



Tools



4122-T (C.TRONIC.105.5) ↓

1 daN = 1 Kg TYPE DE COURROIES		daN	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	daN	1 daN = 1 Kg TYPE DE COURROIES											
<b>S</b> 			18	28	36	44	51	58	64	70	76	82	88	94	100	106	112																		
			18	28	36	44	51	58	64	70	76	82	88	94	100	106	112																		
<b>P</b> 		E5 E6	18	23	27	31	34	37	40	43	46	49	52	54	56	58	60	62	64	66	68														
			25	32	39	45	50	54	58	62	66	70	74	78	81	84	86	88	89	90	91														
<b>P</b> 		E6	32	41	48	55	62	69	76	83	90	96	102	108	114	120	126	132	138	144	150				10										
			27	36	43	49	55	61	66	71	76	80	84																						
<b>P</b> 		E6	32	41	49	57	63	69	75	81	87	93	99													11									
			26	35	42	48	53	58	63	68	73	78	82	30	40	47	54	61	68	75	81						87	93	99						
<b>P</b> 		E7	45	55	65	74	83	89	95	101	107	113	119	36	49	52	64	73	80	86	92			98	104	110								13	
			28	34	39	44	48	52	56	60	64	68	71	34	41	48	55	62	69	76	83			89	96	102									
<b>T</b> 		E7	34	41	48	55	62	69	76	83	89	96	102													10									
			32	39	45	51	56	61	66	71	76	79	81	37	43	51	59	66	73	80	86						92	98	104						
<b>T</b> 		E8	37	43	51	59	66	73	80	86	92	98	104													11									
			52	60	67	74	81	88	94	100	106	110	114	49	57	63	69	75	81	87	93						99	105	111						
<b>T</b> 		E9	49	57	63	69	75	81	87	93	99	105	111													18									

## RECOMMENDATIONS: TIMING BELT

Petrol engine

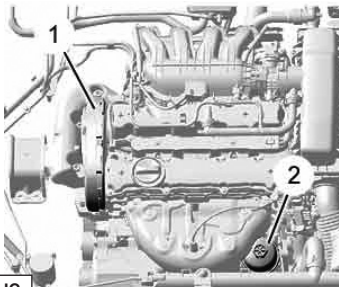
Diesel engine

### Recommendations

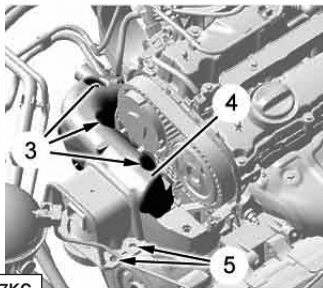
**IMPERATIVE:** After any repair involving removal of the timing belt, systematically replace:

The timing belt,  
The tensioner roller fixing nut.

# CHECKING THE VALVE TIMING



B1BP37JC



B1BP37KC

Engine: KFU

Tools.

- [1] Flywheel setting peg
- [2] Camshaft setting peg
- [3] Camshaft setting peg

- : 4507-TA
- : 4533-TA.C1
- : (-).0194.A

Toolkit 4507-T

**IMPERATIVE: Respect the safety and cleanliness requirements.**

## Checking.

Disconnect the battery.

Remove:

- The engine cover.
- The upper timing cover (1).
- The oil filter (2).

Remove the sparking plugs, to facilitate rotation of the engine.

Turn the engine by means of the crankshaft screw.

**IMPERATIVE: Never turn the engine backwards.**

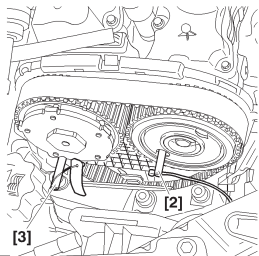
Suspend the engine.

Remove:

- The screws (3), the upper RH engine support (4) and the screws (5).

# CHECKING THE VALVE TIMING

Engine: KFU



B1BP2ZMC

## Checking (continued).

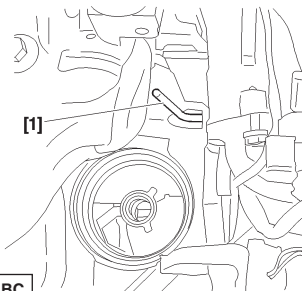
Position the tools [3] and [2].

Peg the flywheel, using tool [1].

**NOTE:** If the setting is not correct, recommence the operation.

Remove the tools.

Complete the refitting.



B1BP2MBC

# CHECKING AND SETTING THE VALVE TIMING

Engine: KFU

Tools.

- |                          |              |
|--------------------------|--------------|
| [1] Flywheel setting peg | : 4507-T.A   |
| [2] Camshaft setting peg | : 4533-T.AC1 |
| [3] Camshaft setting peg | : (-).0194.A |
| [4] Belt retaining pin   | : 4533-TA.D  |

**IMPERATIVE: Respect the safety and cleanliness requirements.**

## Setting the timing.

Raise and support the vehicle, wheels hanging.

Disconnect the battery.

Remove the engine cover.

Raise and support the vehicle, wheels hanging.

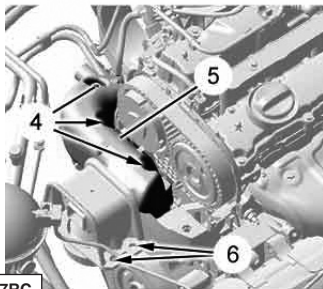
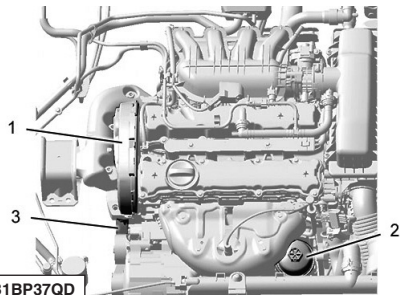
Remove:

- The accessories drive belt **(3)** (*see corresponding operation*).
- The crankshaft pulley, the engine cover.
- The upper timing cover **(1)**.
- The oil filter **(2)**.

Remove the sparking plugs, to facilitate rotation of the engine.

Suspend the engine.

Remove the screws **(4)**, the upper RH engine support **(5)** and the screws **(6)**.



## CHECKING AND SETTING THE VALVE TIMING

### Engine: KFU

#### Setting the timing (continued).

Rotate the engine by means of the crankshaft screw (*clockwise*), to bring it to the pegging position.

Peg the flywheel, using tool [1].

Position the tools [2] and [3].

Remove the engine support assembly (9), the fixing screw (8) and the lower cover (7).

Slacken the nut (11).

Fully detension the belt by moving the tensioner roller (10).

Remove the timing belt.

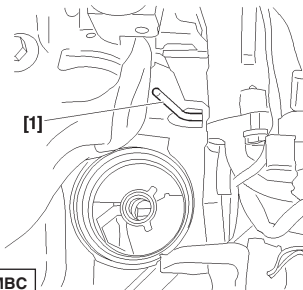
**IMPERATIVE: Check that the tensioner roller turns freely (*no tight spot*).**

#### Refitting.

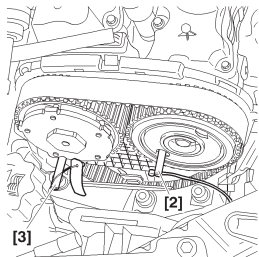
Position the (*new*) timing belt, in the following sequence:

- The inlet camshaft pulley, the exhaust camshaft pulley, the guide roller, the crankshaft pulley, position the tool [4], the coolant pump pulley, the dynamic tensioner roller.

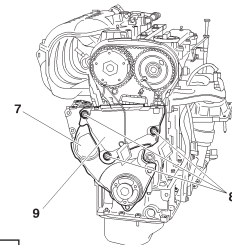
Remove the tools [1], [2], [3] and [4].



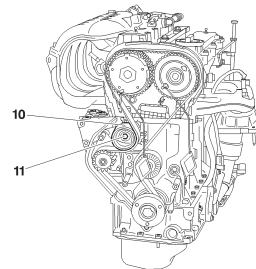
B1BP2MBC



B1BP2ZMC



B1CP0GLD

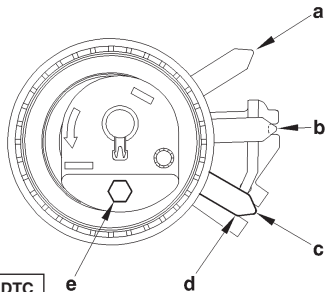


B1CP0GMD

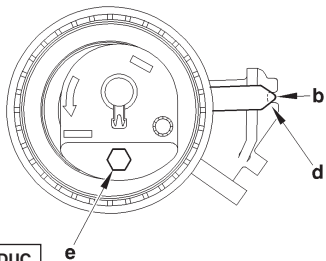


## CHECKING AND SETTING THE VALVE TIMING

Engine: KFU



B1EP1DTC



B1EP1DUC

### Overtension on the belt.

Position «a»: Tensioner roller in **detensioned** position.

Position «b»: Tensioner roller in **normal** position.

Position «c»: Tensioner roller in **overtension** position.

Turn the tensioner roller (10), using an allen spanner at «e».

Place the index «d» in position «c», hold the belt to the maximum of the interval indicated.

Tighten the tensioner roller fixing nut to **2,1 ± 0,2 m.daN**.

Rotate the crankshaft **four turns** (*normal direction of rotation*).

**IMPERATIVE: Never turn it backwards.**

Check the timing setting by refitting the pegs [1], [2] and [3].

Remove the pegs [1], [2] and [3].

### Adjusting the fitting tension of the timing belt.

Slacken the nut, holding the position of the tensioner roller, using an allen spanner at «e».

Bring the index «d» to its adjustment position at «b».

**WARNING:** The index «d» should not go past the notch «b». If it does, repeat the operation to tension the timing belt.

Maintain the roller (10) in this position, using an allen spanner.

Tighten the tensioner roller fixing nut to **2,1 ± 0,2 m.daN**.

**IMPERATIVE: The tensioner roller should not turn during the tightening of its fixing. If it does, repeat the operation to tension the timing belt.**

Complete the refitting.

## CHECKING THE VALVE TIMING

Engine: NFU

Tools.

- [1] Flywheel setting peg
- [2a] Camshaft setting peg
- [3b] Camshaft setting peg

- : 4507-T.A
- : 4533-TA.C1
- : 4533-TA.C2

Toolkit 4507-T

**IMPERATIVE: Respect the safety and cleanliness requirements.**

### Checking.

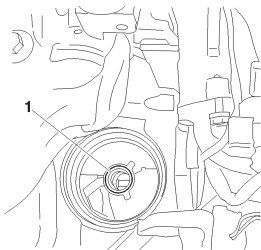
Disconnect the negative terminal of the battery.

Remove:

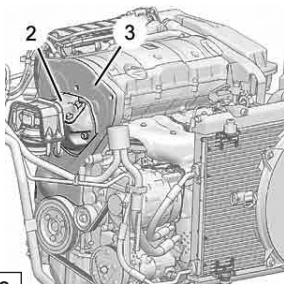
- The oil filter (1).
- Suspend the engine.

Remove:

- The engine support (2) and the upper timing cover (3).



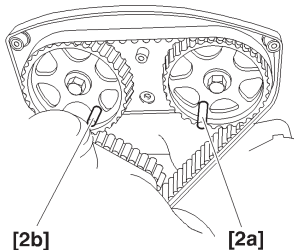
B1BP2M7C



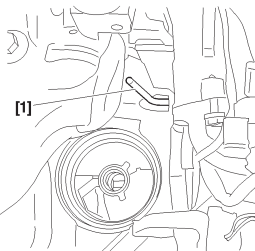
B1BP381C

# CHECKING THE VALVE TIMING

Engine: NFU



B1EP170C



B1BP2MBC

Remove the sparking plugs, to facilitate rotation of the crankshaft.

Rotate the engine by means of the crankshaft pinion screw (*clockwise*) to bring it to the pegging position.

Fit the tools [2a] and [2b].

Peg the flywheel, using tool [1].

**NOTE:** If the setting proves impossible, restart the timing setting operation.

Remove the tools [1], [2a] and [2b].

Complete the refitting.

**IMPERATIVE:** Carry out the operations that are necessary following a reconnection of the battery (*see corresponding operation*).

## CHECKING AND SETTING THE VALVE TIMING

Engine: NFU

### Tools.

- |                                  |              |
|----------------------------------|--------------|
| [1] Flywheel setting peg         | : 4507-T.A   |
| [2a] Camshaft setting peg        | : 4533-TA.C1 |
| [2b] Camshaft setting peg        | : 4533-TA.C2 |
| [3] Belt retaining pin           | : 4533-T.AD  |
| [4] Dynamic tensioner roller pin | : 4200-T.H   |

Toolkit 4507-T

**IMPERATIVE:** Respect the safety and cleanliness requirements.

### Removing.

Raise and support the vehicle, front wheels hanging.

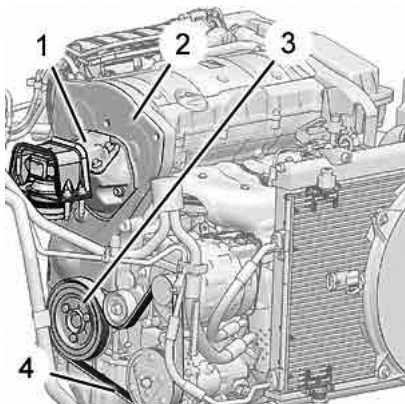
Disconnect the battery.

Remove:

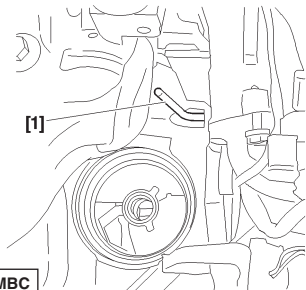
- The auxiliaries drive belt **(4)** (*see corresponding operation*).
- The crankshaft pulley **(3)**.
- The oil filter.

Suspend the engine, using a workshop hoist.

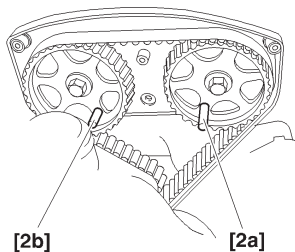
Remove the timing cover, the engine support **(1)**, the intermediate support and the timing cover **(2)**.



# CHECKING AND SETTING THE VALVE TIMING



B1BP2MBC



B1EP170C

## Engine: NFU

Peg the flywheel, using tool [1].

Position the tools [2a] and [2b].

Slacken the tensioner roller.

Turn the dynamic tensioner roller so as to be able to position the tool [4], with the aid of an Allen key placed at «a».

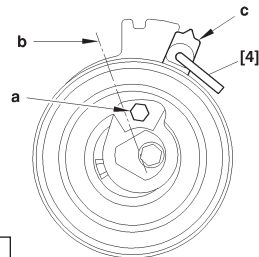
Turn the tensioner roller towards the right to bring it to the index «c» in position «b».

Peg the tensioner roller in this position in order to slacken the timing belt to the maximum.

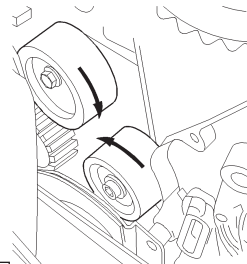
**IMPERATIVE: Never make the dynamic tensioner roller turn by a complete rotation.**

Remove the timing belt (8).

Check that the rollers and the pump pulley turn freely (*no tight spot*).



B1EP18PC



B1EP18QC

## CHECKING AND SETTING THE VALVE TIMING

Engine: NFU

### Refitting.

Fit the **(new)** timing belt in position, in the following order:  
Inlet camshaft pulley, exhaust camshaft pulley, guide roller, crankshaft pulley, position tool [5],  
coolant pump pulley, dynamic tensioner roller.

Remove tools [1], [2a], [2b] and [4].

### Overtension on the belt.

Turn the tensioner roller (7) with the aid of a hexagonal spanner at «a».

Bring the index «c» to position «d», to tension the belt to the maximum of the interval indicated.  
Hold the tensioner roller, using tool [4].

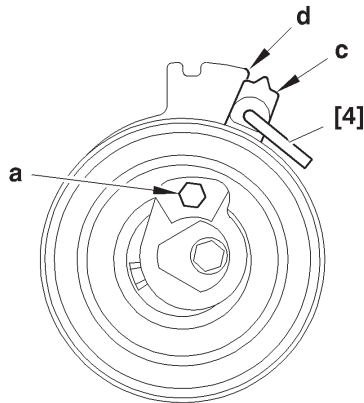
Tighten the fixing nut of the tensioner roller, tightening to **1 m.daN**.

Turn the crankshaft by **4 rotations** (*normal direction of rotation*).

**IMPERATIVE: Never make the crankshaft rotate backwards.**

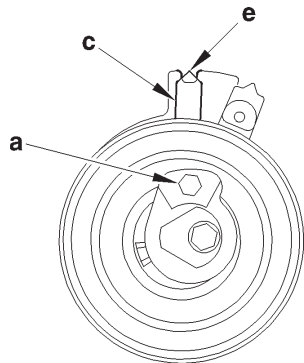
Make sure that the timing is correctly set by refitting the pegs [1], [2a] and [2b].

Remove the pegs [1], [2a], [2b] and [4].



# CHECKING AND SETTING THE VALVE TIMING

Engine: NFU



## Adjusting the fitting tension of the timing belt.

Slacken the nut while maintaining the position of the tensioner roller, with the aid of a hexagonal spanner at «a».

Next bring the index «c» to its adjusting position «e».

**WARNING:** The index «c» must not go beyond the notch «e». If it should do this, restart the timing belt tensioning operation.

Hold the tensioner roller in this position, with the aid of a hexagonal spanner.

Tighten the tensioner roller fixing nut to  $2.2 \pm 0.2$  m.daN.

**IMPERATIVE:** The tensioner roller must not rotate during the tightening of its fixing. If it does, restart the timing belt tensioning operation.

## Refitting.

Refit the timing covers, the crankshaft pulley, the auxiliaries drive belt (*see corresponding operation*). Complete the refitting.

**IMPERATIVE:** Carry out the operations that are necessary following a reconnection of the battery (*see corresponding operation*).

B1EP1HHC

# CHECKING AND SETTING THE VALVE TIMING

Engine: RFJ

Tools.

- [1] Camshaft pinion peg
- [2] Crankshaft setting peg

: (-).0194.A  
: (-).0189.R

**IMPERATIVE: Respect the safety and cleanliness requirements.**

Disconnect the battery.

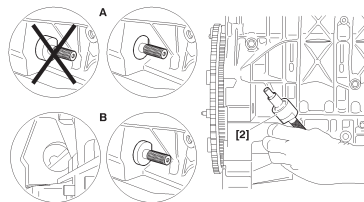
Raise and support the vehicle, front wheels hanging.

Remove the front RH wheel, the plastic pins holding the splash-shield, the splash-shield itself.

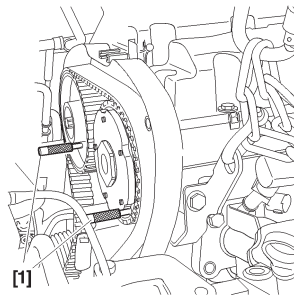
**A:** Pegging on the **manual gearbox.**

**B:** Pegging on the **automatic gearbox.**

Turn the engine by means of the crankshaft pinion screw, to bring it to the pegging position.



B1BP2V3D

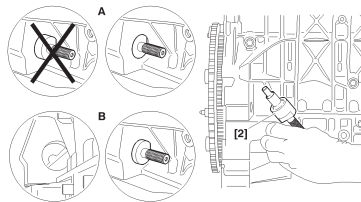


B1BP38VC

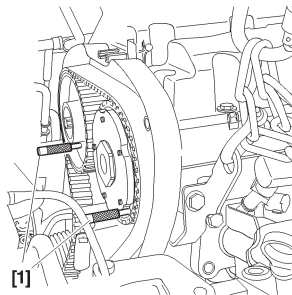


# CHECKING AND SETTING THE VALVE TIMING

Engine: RFJ



B1BP2V3D



B1BP38VC

Peg the crankshaft, using tool [2].

Suspend the engine, using a workshop hoist.  
Remove the RH engine support, the upper timing cover.  
Peg the camshaft pulleys, using tool [1].

**NOTE:** The pegs [1] should go in without forcing.

**WARNING:** If the pegs go in only with difficulty, repeat the operation for fitting and tensioning the timing belt (*see corresponding operation*).

**Refitting.**

Remove tools [1] and [2].  
Complete the refitting.

**IMPERATIVE:** Carry out the operations that are necessary following a reconnection of the battery (*see corresponding operation*).

# CHECKING AND SETTING THE VALVE TIMING

Engine: RFJ

## Tools.

- [1] Camshaft setting peg : (-).0194.B
- [2] Crankshaft setting peg : (-).0189.R
- [3] Timing belt retaining pin : (-) 0189.K
- [4] Adaptor for angular tightening : 4069-T
- [5] Hub immobilising tool : (-).0189.S
- [5a] : (-).0189.S1
- [5b] : (-).0189.S2
- Pliers for removing plastic pins : 7504-T

**IMPERATIVE: Respect the safety and cleanliness requirements.**

**Checking and setting the timing.**

## Removing.

Disconnect the negative terminal of the battery (*see corresponding operation*).

Raise and support the vehicle, front wheels hanging.

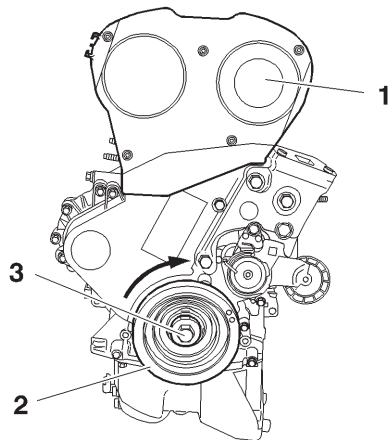
Remove the auxiliaries drive belt (*see corresponding operation*).

Unclip and move aside the fuel supply hose from the timing cover.

Suspend the engine by means of a workshop hoist.

Remove the RH engine support and the timing cover (1).

Turn the engine by means of the screw (3) of the crankshaft pinion (2) to bring it to the pegging position.



B1BP310C

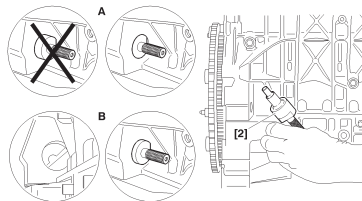
# CHECKING AND SETTING THE VALVE TIMING

Engine: RFJ

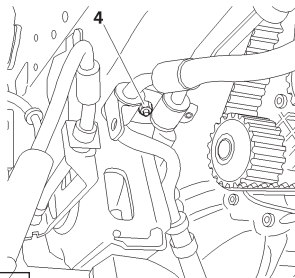
## Checking and setting the timing (continued).

**A:** Pegging on the **manual gearbox**.

**B:** Pegging on the **automatic gearbox**.



B1BP2V3D



B3EP15JC

Peg the crankshaft, using tool [2].

Remove the fixing bracket screw (4).

Move aside the power steering pipes.

Peg the camshaft pulleys (6) and (7), using tool [1].

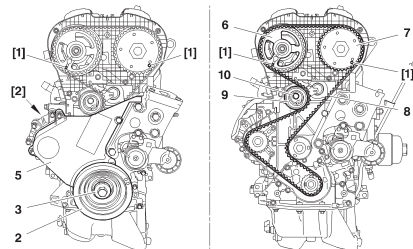
Remove the screw (3), the crankshaft pulley (2) and the lower timing cover (5).

**IMPERATIVE:** Never remove the crankshaft pulley (2), without pegging the crankshaft and the camshafts.

Slacken the screw (10) of the tensioner roller (9).

Turn the tensioner roller (9) (*clockwise*).

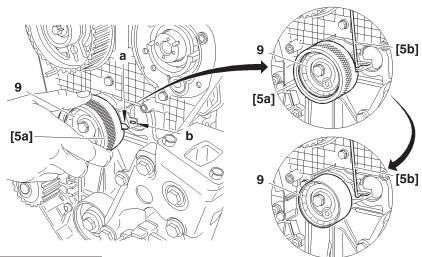
Remove the timing belt (8).



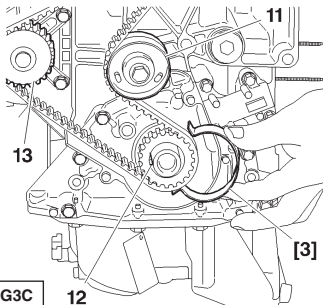
B1EP1G1D

# CHECKING AND SETTING THE VALVE TIMING

Engine: RFJ



B1EP1G2D



B1EP1G3C

## Checking and setting the timing (continued).

### Refitting.

Turn the tensioner roller (9), using tool [5a] to go past the notch «b».

Position the tool [5b] to lock the index «a» and remove the tool [5a].

**NOTE:** Check the presence of the crankshaft pinion keyway (12) before positioning the timing belt.

Reposition the timing belt (8) on the crankshaft pinion (1).

Hold the timing belt in place (8) using tool [3].

Put the timing belt (8) in place, in the following sequence:

- Guide roller (11).
- Inlet camshaft pulley (7).
- Exhaust camshaft pulley (6).
- Coolant pump (13).
- Tensioner roller (9).

**NOTE:** Make sure that the timing belt (8) is as flush as possible with the outer faces of the various pinions and rollers.

Remove tools [3], [1] and [5b].

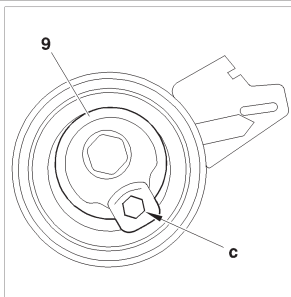
Refit the lower timing cover (5), the pulley (2) and the screw (3) of the crankshaft pulley.

Tighten the screw (3) to  $4 \pm 0,4$  m.daN.

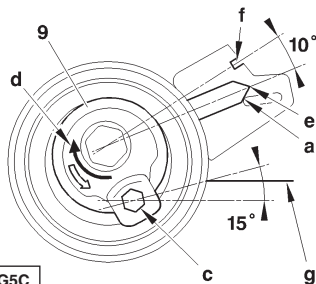
Angular tighten  $40^\circ \pm 4^\circ$ , using tool [4].

# CHECKING AND SETTING THE VALVE TIMING

Engine: RFJ



B1EP1G4C



B1EP1G5C

## Tensioning the timing belt.

### Refitting (continued).

Turn the tensioner roller (9) anti-clockwise, using a hexagonal spanner at «c».  
Place the index «a» in position «e».

**IMPERATIVE:** The index «a» should go past the slot «f» by an angular value of 10°. If it does not, replace the tensioner roller or the tensioner roller and timing belt assembly.

Then bring the index «a» to its adjustment position «f», by turning the tensioner roller in the direction of the arrow «d».

**WARNING:** The index «a» must not go past the slot «f».  
If it does, restart the operation to tension the timing belt.

**IMPERATIVE:** The tensioner roller must not turn during the tightening of its fixing.  
If it does turn, restart the operation to tension the timing belt.

Tighten the screw (10) of the tensioner roller (9) to  $2,1 \pm 0,2$  m.daN.

**IMPERATIVE:** The hexagonal tensioner roller drive should be at approx. 15° below the level of the cylinder head gasket «g».  
Otherwise, replace the tensioner roller or the tensioner roller and timing belt assembly.

## CHECKING AND SETTING THE VALVE TIMING

Engine: RFJ

**Tensioning the timing belt.**

**Refitting (continued).**

Remove the tools [1] and [2].

Rotate the crankshaft **ten times** (*normal direction of rotation*).

**IMPERATIVE: No exterior pressure or action should be applied on the timing belt.**

Peg the inlet camshaft pulley, using tool [1].

**Checking.**

Timing belt tension

**IMPERATIVE: Check the position of the index «a», it should be opposite the slot «f». If the position of the index «a» is not correct, repeat the operations to tension the timing belt.**

Complete the refitting.

**IMPERATIVE: Carry out the operations that are necessary following a reconnection of the battery (*see corresponding operation*).**

# CHECKING THE VALVE TIMING

Engine: RFN

Tools.

- |                            |              |
|----------------------------|--------------|
| [1] Camshaft setting peg   | : (-).0189.A |
| [2] Crankshaft setting peg | : (-).0189.R |

**IMPERATIVE:** Respect the safety and cleanliness requirements.

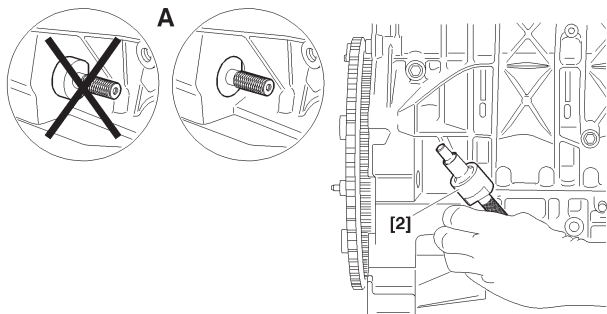
**Checking the timing.**

**Removing.**

Disconnect the battery negative terminal.  
Raise and support the vehicle, front wheels hanging.  
Remove the front RH wheel, the splash-shield and the upper timing cover.

**A:** Pegging on the **manual gearbox**.

Turn the engine by means of the crankshaft pinion screw, to bring it to the pegging position.  
Peg the crankshaft, using tool [2].  
Unclip the fuel supply hose from the timing cover.



B1BP36QD

## CHECKING THE VALVE TIMING

Engine: RFN

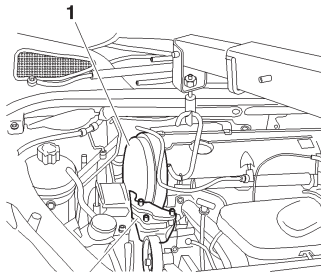
### Checking the timing (continued).

Suspend the engine, using a workshop hoist.  
Remove the engine support **(2)** and the timing cover **(1)**.  
Peg the camshaft pulleys, using tool **[1]**.

**NOTE:** The pegs **[1]** should go in without forcing.

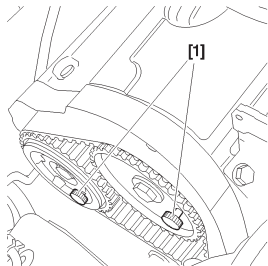
**WARNING:** If the pegs go in only with difficulty, repeat the operation for fitting and tensioning the timing belt (*see corresponding operation*).

Complete the refitting



B1EP1GTC

2



B1EP1GUC



# CHECKING AND SETTING THE VALVE TIMING

Engine: RFN

## Tools.

- [1] Camshaft setting peg : (-).0189.A
- [2] Crankshaft setting peg : (-).0189.R
- [3] Timing belt retaining pin : (-) 0189.K
- [4] Adaptor for angular tightening : 4069-T
- [5] Hub immobilising tool : (-).0189.S
- [5a] : (-).0189.S1
- [5b] : (-).0189.S2

Pliers for removing plastic pins : 7504-T

**IMPERATIVE: Respect the safety and cleanliness requirements.**

## Checking and setting the timing.

### Removing.

Disconnect the negative terminal of the battery (*see corresponding operation*).

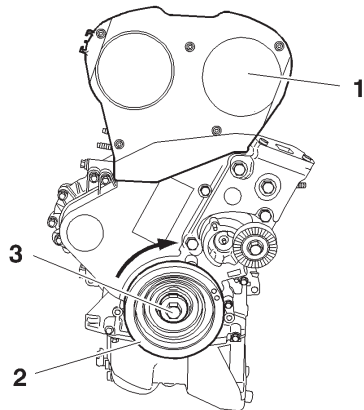
Raise and support the vehicle, front wheels hanging.

Remove the auxiliaries drive belt (*see corresponding operation*).

Unclip and move aside the fuel supply hose from the timing cover.

Remove the timing cover (1).

Turn the engine by means of the screw (3) of the crankshaft pinion (2) to bring it to the pegging position.



B1BP2V4C

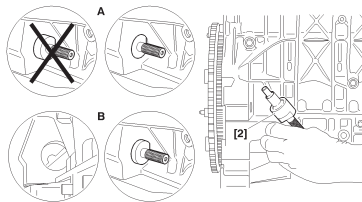
# CHECKING AND SETTING THE VALVE TIMING

Engine: RFN

## Checking and setting the timing (continued).

**A:** Pegging on the **manual gearbox**.

**B:** Pegging on the **automatic gearbox**.



B1BP2V3D

Peg the crankshaft, using tool [2].

Remove the fixing bracket screw (4).

Move aside the power steering pipes.

Peg the camshaft pulleys (6) and (7), using tool [1].

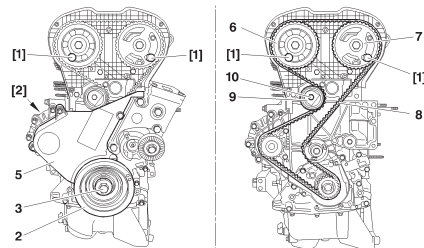
Remove the screw (3), the crankshaft pulley (2) and the lower timing cover (5).

**IMPERATIVE:** Never remove the crankshaft pulley (2), without pegging the crankshaft and the camshafts.

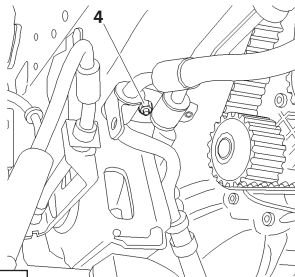
Slacken the screw (10) of the tensioner roller (9).

Turn the tensioner roller (9) (*clockwise*).

Remove the timing belt (8).



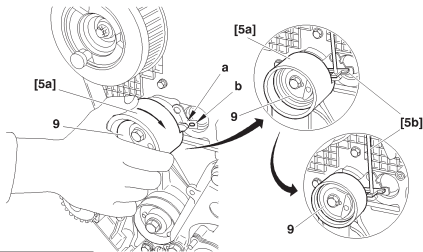
B1EP1G8D



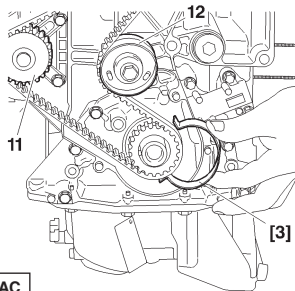
B3EP15JC

# CHECKING AND SETTING THE VALVE TIMING

Engine: RFN



B1EP1G9D



B1EP1GAC

## Checking and setting the timing (continued).

### Refitting.

Turn the tensioner roller (9), using tool [5a] to go past the notch «b». Position the tool [5b] to lock the index «a» and remove the tool [5a]. Reposition the timing belt (10) on the crankshaft pinion (1). Hold the timing belt in place (10) using tool [3].

Put the timing belt (10) in place, in the following sequence:

- Guide roller (12).
- Inlet camshaft pulley (7).
- Exhaust camshaft pulley (6).
- Coolant pump (11).
- Tensioner roller (9).

**NOTE:** Make sure that the timing belt (10) is as flush as possible with the outer faces of the various pinions and rollers.

Remove tools [3], [1] and [5b].

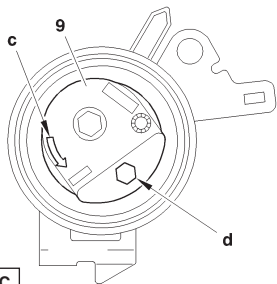
Refit the lower timing cover (5), the pulley (2) and the screw (3) of the crankshaft pulley.

Tighten the screw (3) to  $4 \pm 0,4 \text{ m.daN}$ .

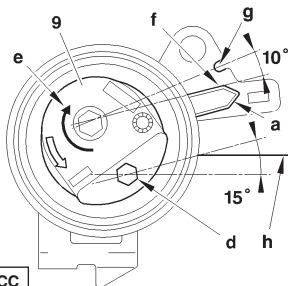
Angular tighten  $53^\circ \pm 4^\circ$ , using tool [4].

## CHECKING AND SETTING THE VALVE TIMING

Engine: RFN



B1EP1GBC



B1EP1GCC

**Tensioning the timing belt.**

**Refitting (continued).**

Turn the tensioner roller (9) in the direction of the arrow «c», using a **hexagonal spanner** at «d». Place the index «a» in position «f»

**IMPERATIVE:** The index «a» should go past the slot «g» by an angular value of 10°. If it does not, replace the tensioner roller or the tensioner roller and timing belt assembly.

Then bring the index «a» to its adjustment position «g», by turning the tensioner roller in the direction of the arrow «e».

**WARNING:** The index «a» must not go past the slot «g».

If it does, restart the operation to tension the timing belt.

**IMPERATIVE:** The tensioner roller must not turn during the tightening of its fixing. If it does turn, restart the operation to tension the timing belt.

Tighten the screw (8) of the tensioner roller (9) to  $2,1 \pm 0,2$  m.daN.

**IMPERATIVE:** The hexagonal tensioner roller drive should be at approx. 15° below the level of the cylinder head gasket «h».

Otherwise, replace the tensioner roller or the tensioner roller and timing belt assembly.

## CHECKING AND SETTING THE VALVE TIMING

Engine: RFN

**Tensioning the timing belt.**

**Refitting (continued).**

Remove the tools [1] and [2].

Rotate the crankshaft **ten times** (*normal direction of rotation*).

**IMPERATIVE: No exterior pressure or action should be applied on the timing belt.**

Peg the inlet camshaft pulley, using tool [1].

**Checking.**

Timing belt tension.

**IMPERATIVE: Check the position of the index «a», it should be opposite the slot «g». If the position of the index «a» is not correct, repeat the operations to tension the timing belt.**

Complete the refitting.

**IMPERATIVE: Carry out the operations that are necessary following a reconnection of the battery (*see corresponding operation*).**

## CHECKING THE VALVE TIMING

Engine: RFK

### Tools.

[1] Camshaft setting peg

: (-).0194.B

[2] Crankshaft setting peg

: (-).0189.R

**IMPERATIVE:** Respect the safety and cleanliness requirements.

### Checking the timing.

#### Removing.

Disconnect the battery negative terminal.

Raise and support the vehicle, front wheels hanging.

Remove the front RH wheel and the splash-shield.

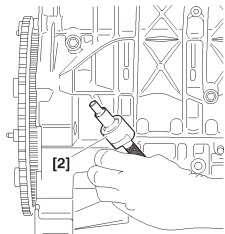
#### A: Pegging on the **manual gearbox**.

Turn the engine by means of the crankshaft pinion screw, to bring it to the pegging position.

Peg the crankshaft, using tool [2].

Unclip:

- The fuel supply hose from the timing cover.
- The fuel vapour re-induction circuit.



## CHECKING THE VALVE TIMING

Engine: RFK

### Checking the timing (continued).

Suspend the engine, using a workshop hoist.

Remove:

- The RH engine support.
- The upper timing cover.

Peg the camshaft pulleys, using tool [1].

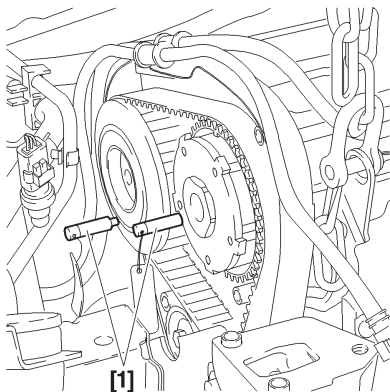
**NOTE:** The pegs [1] should go in without forcing.

**WARNING:** If the pegs go in only with difficulty, repeat the operation for fitting and tensioning the timing belt (*see corresponding operation*).

Remove the pegs [1] and [2].

Complete the refitting.

**IMPERATIVE:** Carry out the operations that are necessary following a reconnection of the battery (*see corresponding operation*).



B1EP1GRC

## CHECKING AND SETTING THE VALVE TIMING

Engine: RFK

### Tools.

[1] Camshaft setting peg	: (-).0189.A
[2] Crankshaft setting peg	: (-).0189.R
[3] Timing belt retaining pin	: (-) 0189.K
[4] Adaptor for angular tightening	: 4069-T
[5] Hub immobilising tool	: (-).0189.S
[5a]	: (-).0189.S1
[5b]	: (-).0189.S2
Pliers for removing plastic pins	: 7504-T

**IMPERATIVE:** Respect the safety and cleanliness requirements.  
**Checking and setting the timing.**

### Removing.

Disconnect the negative terminal of the battery (*see corresponding operation*).

Raise and support the vehicle, front wheels hanging.

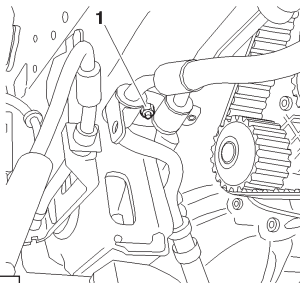
Remove the auxiliaries drive belt (*see corresponding operation*).

Unclip and move aside the fuel supply hose from the timing cover.

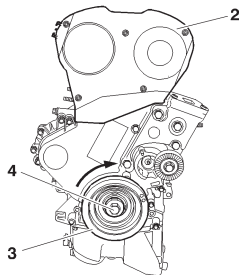
Remove the screw (1).

Move aside the power steering pipes.

Turn the engine by means of the screw (4) of the crankshaft pinion (3) to bring it to the pegging position.



B3EP15YC



B1BP36YC



# CHECKING AND SETTING THE VALVE TIMING

Engine: RFK

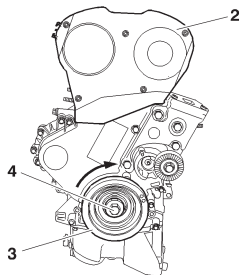
Checking and setting the timing (continued).

Peg the crankshaft using tool [2].

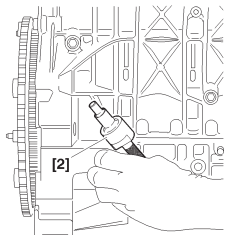
Suspend the engine, using a workshop hoist.

Remove:

- The upper RH engine support.
- The upper timing cover (2).



B1BP36YC



[2]

B1BP2V5D

## CHECKING AND SETTING THE VALVE TIMING

Engine: RFK

Checking and setting the timing (continued).

Peg the camshaft pulleys (6) and (7), using tool [1].

Remove:

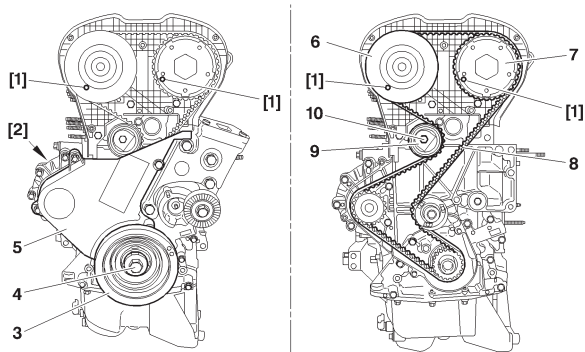
- The screw (4).
- The crankshaft pulley (3).
- The lower timing cover (5).

**IMPERATIVE:** Never remove the crankshaft pulley (3), without pegging the crankshaft and the camshafts.

Slacken the screw (10) of the tensioner roller (9).

Turn the tensioner roller (9) (*clockwise*).

Remove the timing belt (8).



B1EP1GWD

# CHECKING AND SETTING THE VALVE TIMING

Engine: RFK

## Checking and setting the timing (continued).

### Refitting.

Turn the tensioner roller (9), using tool [5a] to go past the notch «b». Position the tool [5b] to lock the index «a» and remove the tool [5a]. Reposition the timing belt (8) on the crankshaft pinion (3). Hold the timing belt (8) in place, using tool [3].

Put the timing belt (8) in place, in the following sequence:

- Guide roller (12).
- Inlet camshaft pulley (7).
- Exhaust camshaft pulley (6).
- Coolant pump (11).
- Tensioner roller (9).

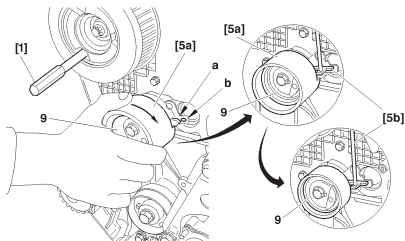
**NOTE:** Make sure that the timing belt (8) is as flush as possible with the outer faces of the various pinions and rollers.

Remove tools [3], [1] and [5b].

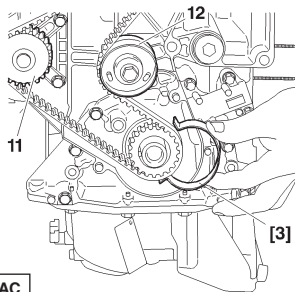
Refit the lower timing cover (5), the pulley (3) and the screw (4) of the crankshaft pulley.

Tighten the screw (4) to  $4 \pm 0,4$  m.daN.

Angular tighten  $80^\circ \pm 5^\circ$ , using tool [4].



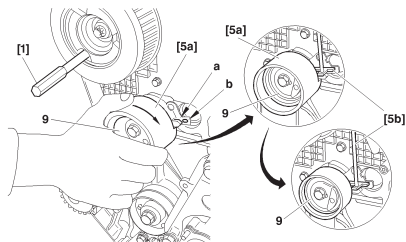
B1EP1GXD



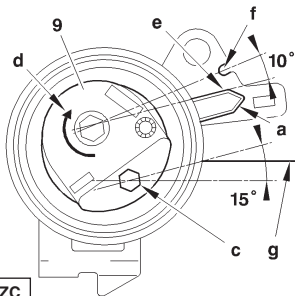
B1EP1GAC

## CHECKING AND SETTING THE VALVE TIMING

Engine: RFK



B1EP1GXD



B1EP1GZC

### Tensioning the timing belt.

Turn the tensioner roller (9) anti-clockwise, using a hexagonal spanner at «c». Place the index «a» in position «e».

**IMPERATIVE:** The index «a» should go past the slot «f» by an angular value of 10°. If it does not, replace the tensioner roller or the tensioner roller and timing belt assembly.

Then bring the index «a» to its adjustment position «f», by turning the tensioner roller in the direction of the arrow «d».

**WARNING:** The index «a» must not go past the slot «f». If it does, restart the operation to tension the timing belt.

**IMPERATIVE:** The tensioner roller must not turn during the tightening of its fixing. If it does turn, restart the operation to tension the timing belt.

Tighten the screw (10) of the tensioner roller (9) to  $2,1 \pm 0,2$  m.daN.

**IMPERATIVE:** The hexagonal tensioner roller drive should be at approx. 15° below the level of the cylinder head gasket «g». Otherwise, replace the tensioner roller or the tensioner roller and timing belt assembly.

## CHECKING AND SETTING THE VALVE TIMING

Engine: RFK

Checking and setting the timing (continued).

Refitting (continued).

Remove the tools [1] and [2].

Refit the upper RH engine support.

Remove the workshop hoist.

Rotate the crankshaft **ten times** (*normal direction of rotation*).

**IMPERATIVE: No exterior pressure or action should be applied on the timing belt.**

Suspend the engine using a workshop hoist.

Remove the upper RH engine support.

Peg the inlet camshaft pulley, using tool [1].

**Checking.**

Timing belt tension

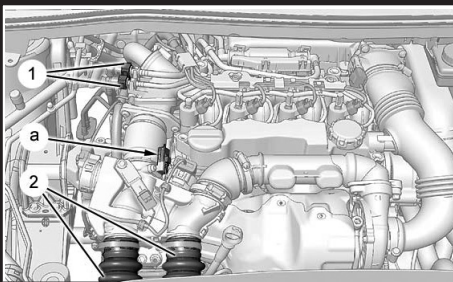
**IMPERATIVE: Check the position of the index «a», it should be opposite the slot «f». If the position of the index «a» is not correct, repeat the operations to tension the timing belt.**

Complete the refitting.

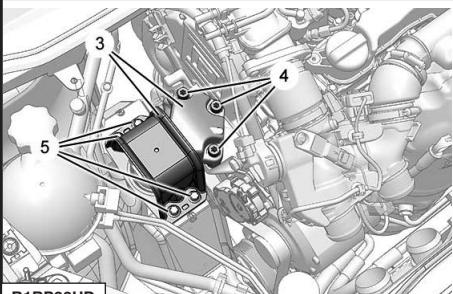
**IMPERATIVE: Carry out the operations that are necessary following a reconnection of the battery (*see corresponding operation*).**

## CHECKING THE VALVE TIMING

Engines: 9HX - 9HY - 9HZ



B1BP38TD



B1BP38UD

### Tools.

- |                            |              |
|----------------------------|--------------|
| [1] Flywheel setting peg   | : (-).0194.C |
| [2] Camshaft setting peg   | : (-).0194.B |
| [3] Crankshaft setting peg | : (-).0194.A |

**IMPERATIVE:** Respect the safety and cleanliness requirements specific to High pressure Diesel injection (HDi) engine versions.

### Checking and setting the timing.

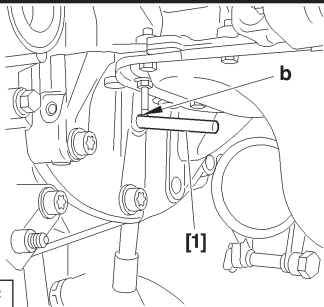
Raise and support the vehicle, wheels hanging.  
Disconnect the battery.

Uncouple:

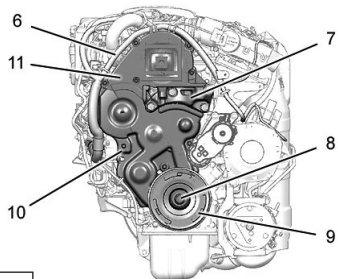
- The fuel supply unions (1).
- The air/air heat exchanger inlet and outlet pipes (3).
- The exhaust line at the catalytic converter flexible pipe.
- Disconnect the connecteur at «a».
- Remove the accessories drive belt (*see corresponding operation*).
- Support the engine with a roller jack equipped with a block.
- Remove the four screws (5), the three screws (4) and the engine supports (3).

# CHECKING THE VALVE TIMING

Engines: 9HX - 9HY - 9HZ



B1BP305C



B1EP1HJD

Turn the engine in the normal direction of rotation until the peg [1] engages in the setting hole.

Peg the flywheel at «b», using tool [1].  
Move aside the electrical harness (6).

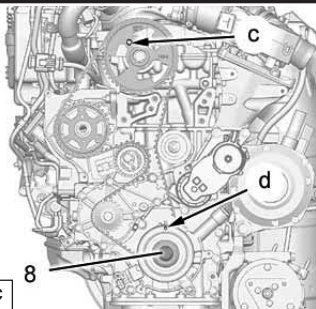
Remove:

- The engine support (7).
- The screw (8).
- The accessories drive pulley (9).
- The lower timing cover (10).
- The upper timing cover (11).
- The tool [1].
- Refit the screw (8).
- Rotate the crankshaft six times (*clockwise*).

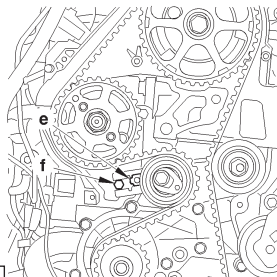
**IMPERATIVE: Never turn it backwards.**

## CHECKING THE VALVE TIMING

Engines: 9HX - 9HY - 9HZ



B1EP1HKC



B1EP1E5C

### Checking the timing (continued).

Peg the camshaft at «c», using tool [2] (*oil the pegs*).

**WARNING:** The magnetic track should not show any sign of damage and should not be approached by any other magnetic source.

Peg the crankshaft at «d», using tool [3].

**ESSENTIAL:** Should it not be possible to peg the camshaft, check that the offset between the camshaft pinion hole and the pegging hole is not more than 1 mm. If it is more, repeat the operation to position the timing belt (*see corresponding operation*).

**Note :** The index «e» of the dynamic tensioner roller should be centred in the interval «f».

Check the correct positioning of the index «e».

If it is not correct, repeat the operation to tension the timing belt (*see corresponding operation*).

**Remove tools [2] and [3].**

### Refitting.

Peg the flywheel at «b», using tool [1].

Remove the screw (8).

Refit the upper timing cover (11), lower timing cover (10), the accessories drive pulley (9), the screw (8).

### Tightening method for the screw (8):

- Pre-tighten to  $3 \pm 0,3 \text{ m.daN}$

- Angular tighten  $180^\circ \pm 5^\circ$

Remove the tool [1] and complete the refitting.

**IMPERATIVE:** Carry out the operations that are necessary following a reconnection of the battery (*see corresponding operation*).



# CHECKING AND SETTING THE VALVE TIMING

Engines: 9HX - 9HY - 9HZ

## Tools.

- |                            |              |
|----------------------------|--------------|
| [1] Flywheel setting peg   | : (-).0194.C |
| [2] Camshaft setting peg   | : (-).0194.B |
| [3] Crankshaft setting peg | : (-).0194.A |

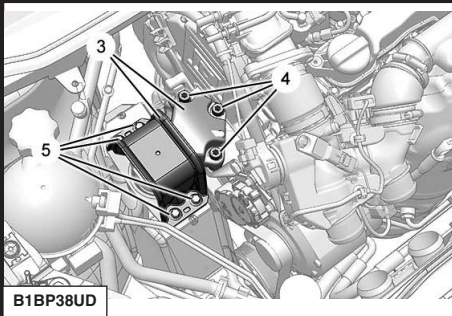
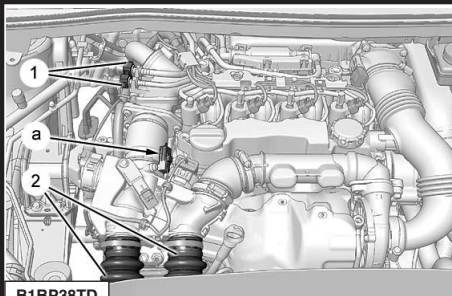
**IMPERATIVE:** Respect the safety and cleanliness requirements specific to High pressure Diesel injection (HDi) engine versions.

## Checking and setting the timing.

Raise and support the vehicle, wheels hanging.  
Disconnect the battery.

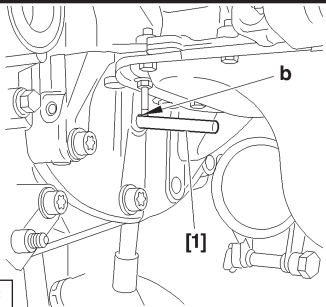
Uncouple:

- The fuel supply unions (1).
- The air/air heat exchanger inlet and outlet pipes (3).
- The exhaust line at the flexible pipe.
- Disconnect the connecteur at «a».
- Remove the accessories drive belt (*see corresponding operation*).
- Support the engine with a roller jack equipped with a block.
- Remove the four screws (5), the three screws (4) and the engine supports (3).

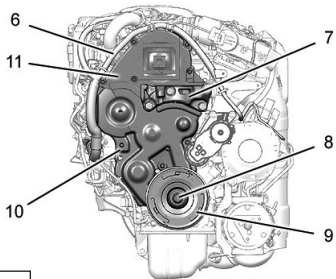


## CHECKING AND SETTING THE VALVE TIMING

Engines: 9HX - 9HY - 9HZ



B1BP305C



B1EP1HJD

### Checking and setting the timing (continued).

Turn the engine in the normal direction of rotation until the peg [1] engages in the setting hole.

Peg the flywheel at «b», using tool [1].

Move aside the electrical harness (6).

Remove:

- The engine support (7).
- The screw (8).
- The accessories drive pulley (9).
- The lower timing cover (10).
- The upper timing cover (11).
- The tool [1].

Refit the screw (8).

Rotate the crankshaft to bring the camshaft to its pegging point.

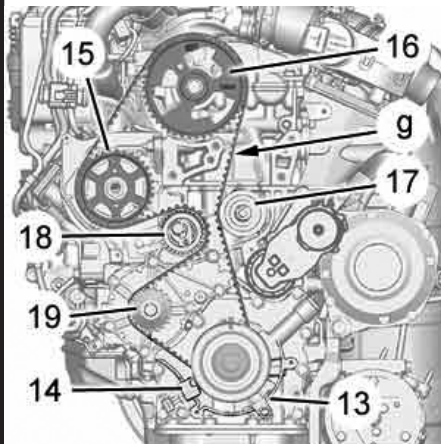
**Peg:**

- The camshaft at «c», using tool [2] (*oil the pegs*).
- The fuel high pressure pump pulley (15) at «f» using a **5 mm diameter** peg.

**WARNING:** Do not touch or damage the track of the engine speed sensor target (14).

# CHECKING AND SETTING THE VALVE TIMING

Engines: 9HX - 9HY - 9HZ



## Checking and setting the timing (continued).

Peg the crankshaft at «e», using tool [3].

Remove:

- The timing belt protector (13).
- The engine speed sensor (14).

Slacken the screw (12) of the tensioner roller, and keep it slackened using an allen spanner at «d».

Detension the timing belt by pivoting the tensioner roller (*clockwise*).

Remove the timing belt, starting with the coolant pump pinion.

## Checks.

**ESSENTIAL:** Just prior to refitting, proceed to the checks as below.

Check:

- That the rollers and the coolant pump pulley turn freely (*without play and without tight spot*).
- That there are no signs of oil leaks (*at the crankshaft and camshaft seals*).
- That there are no leaks of coolant fluid (*at the coolant pump*).
- That the track of the engine speed sensor target (14) is not damaged or scratched.

Replace any components that are defective (*if necessary*).

## CHECKING AND SETTING THE VALVE TIMING

Engines: 9HX - 9HY - 9HZ

Checking and setting the timing (continued).

### Refitting.

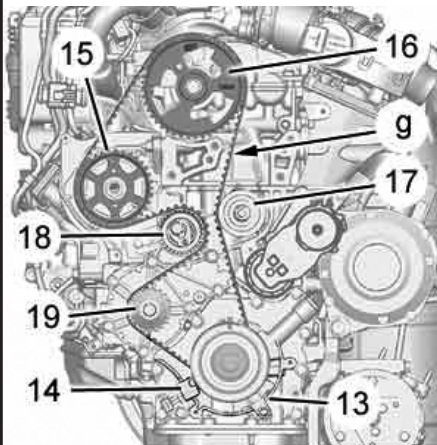
Fit the timing belt on the crankshaft pinion.  
Position the belt on the guide roller, belt well tensioned.

Refit:

- The timing belt protector (13).
- The engine speed sensor (14).

Reposition the timing belt, strip «f» well tensioned, in the following sequence:

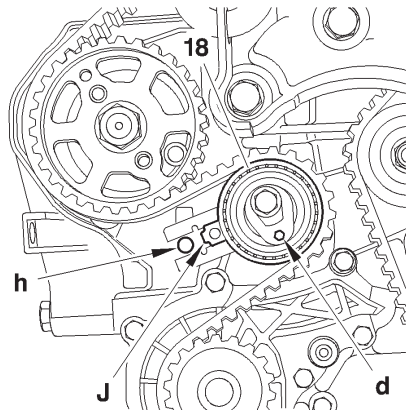
- Guide roller (17).
- Camshaft pulley (16).
- Fuel high pressure pump pulley (15).
- Coolant pump pulley (19).
- Tensioner roller (18).



B1EP1HMC

# CHECKING AND SETTING THE VALVE TIMING

Engines: 9HX - 9HY - 9HZ



## Adjusting the timing belt tension.

Act on the tensioner roller (18) to align the marks «j» and «h», avoiding detensioning the timing belt, using an allen spanner at «d».

Should this fail, repeat the operation to tension the timing belt.

Hold the tensioner roller (18).

Tighten the tensioner roller fixing nut to  $3,7 \pm 0,3$  m.daN.

Check the position of the tensioner roller (*the alignment of the marks «j» and «h» should be correct*).

Remove tools [2] and [3].

Rotate the crankshaft six times (*clockwise*).

**IMPERATIVE:** Never rotate the engine backwards.

**WARNING:** Do not touch or damage the track of the target of the engine speed sensor (14).

Peg the crankshaft, using tool [3].

Check the position of the tensioner roller (*the alignment of the marks «j» and «h» should be correct*).

If this is not the case, repeat the operation to tension the timing belt.

Peg the camshaft pulley, using tool [2].

B1EP1HNC

## CHECKING AND SETTING THE VALVE TIMING

Engines: 9HX - 9HY - 9HZ

**IMPERATIVE:** Should it be impossible to peg the camshaft, check that the offset between the camshaft hole and the pegging hole is not more than 1 mm. If the offset is too great, repeat the operation to position the timing belt (*see corresponding operation*).

Remove the tools [2] and [3].

Refit tool [1] at «b».

Remove the screw (8).

Refit:

- The upper timing cover (11).
- The lower timing cover (12).
- The pulley (9).
- The screw (8).

**Tightening method** for the screw (8):

- Pre-tighten to  $3 \pm 0,3 \text{ m.daN}$ .
- Angular tighten  $180^\circ \pm 5^\circ$ .
- Remove tool [1].

Refit:

- The engine support (7), tighten to  $5,5 \pm 0,9 \text{ m.daN}$ .
- The engine support (3).
- The four screws (5), tighten to  $5,5 \pm 0,8 \text{ m.daN}$ .
- The three screws (4), tighten to  $5,5 \pm 0,8 \text{ m.daN}$ .
- The electrical harness (6).

Disengage the jack from under the engine.

Complete the refitting.

**IMPERATIVE:** Carry out the operations that are necessary following a reconnection of the battery (*see corresponding operation*).

# CHECKING THE VALVE TIMING

Engine: RHR

## Tools.

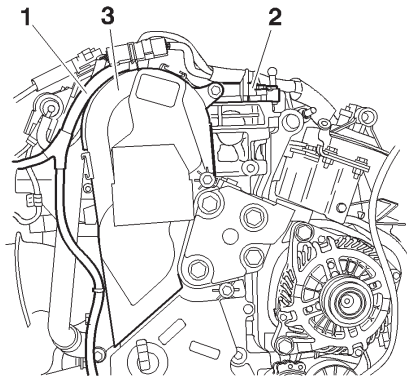
- |                                 |              |                |
|---------------------------------|--------------|----------------|
| [1] Kit of plugs                | : (-).0188.T |                |
| [2] Double flywheel setting peg | : (-).0188.X | Toolkit 0188-T |
| [3] Camshaft setting peg        | : (-).0188.M |                |

**IMPERATIVE: Respect the safety and cleanliness requirements specific to High pressure Diesel injection (HDi) engine versions**

Remove the engine cover and the battery.  
 Disconnect the negative terminal of the battery.  
 Raise and support the front of the vehicle.  
 Remove the under-engine sound-deadening and the front RH splash-shield.  
 Uncouple, plug and move aside, using tool [1], the fuel supply and fuel return pipes..  
 Suspend the engine, using a workshop hoist.  
 Remove the engine support bracket and the engine support.  
 Move aside the electrical harness (1).

Remove:

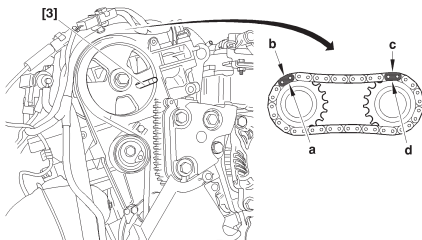
- The camshaft position sensor.
- The inlet cylinder head cover (2).
- The upper timing cover screws.
- The upper timing cover (3).



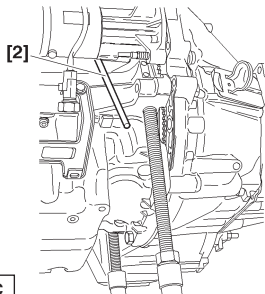
B1EP1GFC

## CHECKING THE VALVE TIMING

Engine: RHR



B1EP1FND



B1BP31FC

### Checks.

Turn the crankshaft in the normal direction of rotation.

Line up the black markings «b» and «c» on the chain with the teeth «a» and «d» of the camshaft drive pinions (**40 turns of the camshafts maximum**).

**IMPERATIVE:** If it is impossible to line up the markings on the chain with the camshaft drive pinions, repeat the setting of the camshafts (*see operation: removing-refitting camshafts*).

Peg:

- The crankshaft, using tool [2].
- The camshaft pinion, using tool [3].

Remove tools [1] and [3].

Complete the refitting.



# CHECKING AND SETTING THE VALVE TIMING

Engine: RHR

## Tools.

- |                                 |               |
|---------------------------------|---------------|
| [1] Kit of plugs                | : (-).0188.T  |
| [2] Double flywheel setting peg | : (-).0188.X  |
| [3] Camshaft setting peg        | : (-).0188.M  |
| [4] Belt clamp                  | : (-).0188.AD |
| [5] Pinion centrer              | : (-).0188.AH |
| [6] Flywheel lock               | : (-).0188.F  |
| [7] Pulley                      | : (-).0188.P  |

**IMPERATIVE:** Respect the safety and cleanliness requirements specific to High pressure Diesel injection (HDi) engine versions.

## Removing.

Slacken the front RH wheel bolts.

Raise and support the front RH side of the vehicle.

Disconnect the negative terminal of the battery.

Remove:

- The under-engine sound-deadening
- The front RH wheel
- The front RH splash-shield.
- The engine cover.

Remove the auxiliaries drive belt (*see corresponding operation*).

## CHECKING AND SETTING THE VALVE TIMING

### Engine: RHR

Uncouple, plug and move aside, using tool [7], the fuel delivery pipe (1) and the fuel return pipe (2). Suspend the engine, using a workshop hoist. Remove the bracket (3) and the RH engine support (4). Move aside the electrical harness (5).

Remove:

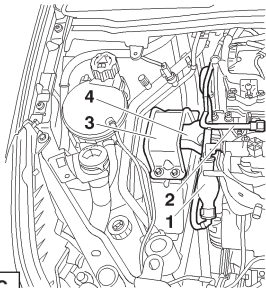
- The upper timing cover screws.
- The upper timing cover (6).

Rotate the engine by means of the auxiliaries drive pulley. Orient the camshaft pinion in the pegging position, use a mirror if necessary.

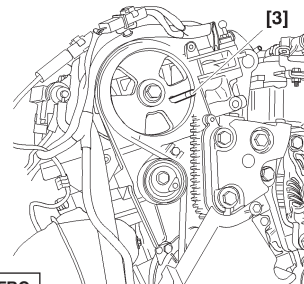
Peg the camshaft, using tool [3].

Peg the engine flywheel, using tool [2].

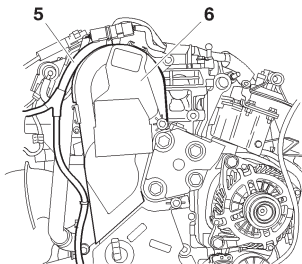
Lock the flywheel, using tool [6].



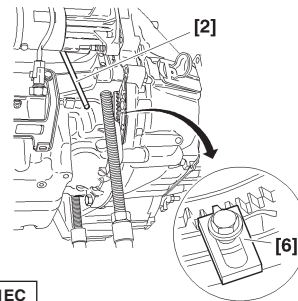
B1BP351C



B1EP1FBC



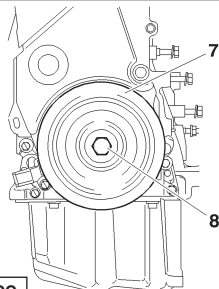
B1EP1FAC



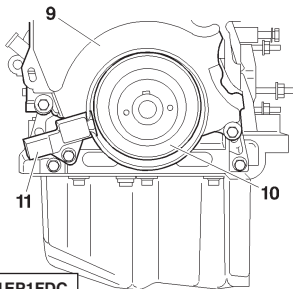
B1BP31EC

# CHECKING AND SETTING THE VALVE TIMING

Engine: RHR



B1EP1FCC



B1EP1FDC

Remove:

- The screw (8).
- The auxiliaries drive pulley (7).
- The crankshaft position sensor (11).
- The lower timing cover (9).
- The target of the crankshaft position sensor (10), using tool [7].
- The lower torque reaction rod.
- The tool [6].

Slacken the screw (12) of the tensioner roller (17).

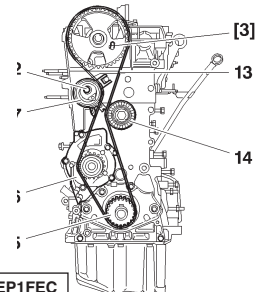
Remove the timing belt (13).

**Checks.**

**IMPERATIVE: Just before refitting, carry out the checks below.**

Check:

- That the rollers (14) and (17) turn freely (*without play and without any tight spot*).
  - That the coolant pump pulley (16) turns freely (*without play and without any tight spot*).
  - That there are no traces of oil leaks from the crankshaft and camshaft seals, etc.
  - That the crankshaft pinion travels freely on the keyway.
- Replace defective components if necessary.



B1EP1FEC

# CHECKING AND SETTING THE VALVE TIMING

Engine: RHR

## Refitting.

Centre the crankshaft pinion (15), using tool [5].

Reposition the timing belt, belt at «a» well tensioned, in the following order:

- Guide roller (14).
- Crankshaft pinion (15).
- Coolant pump pinion (16).
- Tensioner roller (17).

Remove tools [4] and [5].

Bring the index «d» outside the plate at «c», by turning the tensioner roller in the direction of the arrow «b», using a hexagonal spanner at «e».

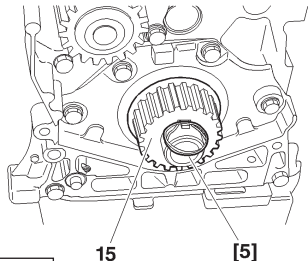
Tighten screw (12) of the tensioner roller (17) to  $2,1 \pm 0,2$  m.daN.

Lock the flywheel, by means of tool [6].

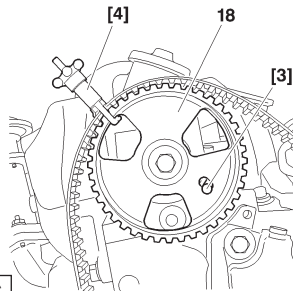
Refit the auxiliaries drive pulley (7).

Tighten the screw (8) to  $7 \pm 0,7$  m.daN.

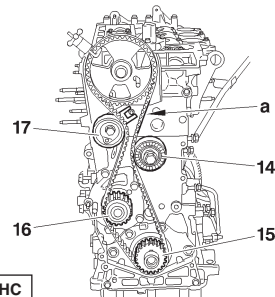
Remove tools [6], [2] and [3].



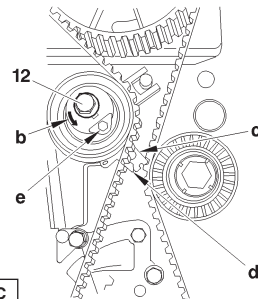
B1EP1FFC



B1EP1FGC



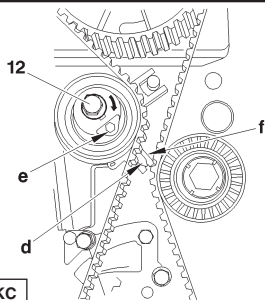
B1EP1FHC



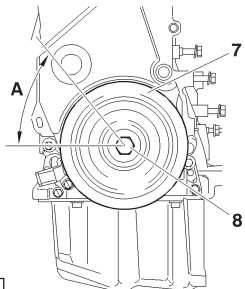
B1EP1FJC

# CHECKING AND SETTING THE VALVE TIMING

Engine: RHR



B1EP1FKC



B1EP1FLC

## Refitting.

Rotate the crankshaft **ten times** (*in the direction of rotation of the engine*).  
Peg the crankshaft, using tool [2] and the camshaft drive pinion, using tool [3].  
Lock the flywheel, using tool [6].

Slacken the screw (8) of the auxiliaries drive pulley (7) and the screw (12) of the tensioner roller (17).

Turn the tensioner roller (*clockwise*), using a hexagonal spanner at «e».

Position the index «d» opposite the notch «f».

## Tighten:

- The screw (12) of the tensioner roller (17) to  $2,1 \pm 0,2$  m.daN.
- The auxiliaries drive pulley to  $7 \pm 0,7$  m.daN.

Remove tools [2], [3] and [6].

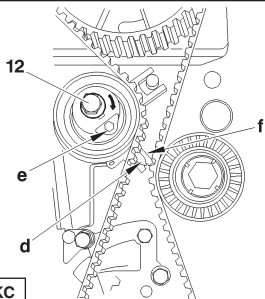
Rotate the crankshaft two times (*in the direction of rotation of the engine*).

Refit tools [2] and [3].

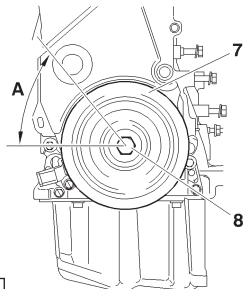
Check in the position of the index «d», it should be opposite the notch «f».

## CHECKING AND SETTING THE VALVE TIMING

Engine: RHR



B1EP1FKC



B1EP1FLC

### Refitting.

**IMPERATIVE:** If the position of the index «d» is not correct, restart the operations to tension the timing belt (*for this, slightly slacken the screw (12) of the tensioner roller*).

Refit tool [6].

Remove the auxiliaries drive pulley (7).

Refit:

- The crankshaft position sensor target (10).
- The lower timing cover (9).
- The crankshaft position sensor (11).
- The lower torque reaction rod.
- Take away the workshop hoist.

Coat the screw (8) with **Loctite FRENETANCH**.

Refit the auxiliaries drive pulley (7) and the screw (8) with its washer.

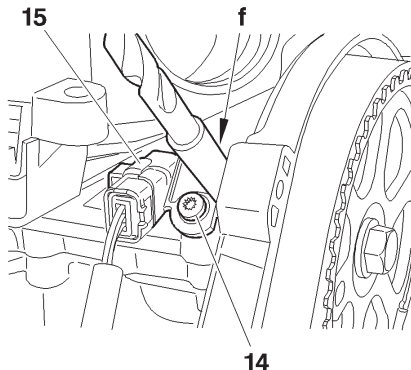
Tighten the screw (8) to  $7 \pm 0,7$  m.daN, then angular tighten by  $A = 60^\circ \pm 5^\circ$ .

Remove tools [2], [3] and [6].

Complete the refitting.

# ADJUSTING THE CAMSHAFT POSITION SENSOR

**Engines: 9HX - 9HY - 9HZ**



**NOTE:** When removing a camshaft sensor, respect the airgap between the sensor and the target.

Slacken the screw **(14)**.

Push back the camshaft position sensor **(15)** to the end of slots.

Do up the screw **(14)** a few turns.

Adjust the airgap **(1,2 mm)** of the camshaft position sensor **(15)**.

### New sensor.

New camshaft position sensor:

- Place the tip of the position sensor in contact with the target on the camshaft pulley **(5)**.

### Re-used sensor.

Camshaft position sensor re-used:

- Place a drill bit at «f» (**Ø 9,5 mm**) between the camshaft position sensor **(15)** and the timing cover **(6)**.

Tighten the screw **(14)** to **0,4 ± 0,1 m.daN**.

## CHECKING THE ENGINE COMPRESSION RATES

Engines: 9HX - 9HY - 9HZ

### Tools.

- |                         |                     |
|-------------------------|---------------------|
| [1] Compression meter   | : MULLER 203102-100 |
| [2] Dummy sparking plug | : (-).0194.G        |

### Removing.

**IMPERATIVE:** Respect the safety and cleanliness requirements specific to High pressure Diesel injection (HDi) engine versions.

Remove the engine cover and the battery.  
Disconnect the negative terminal of the battery.

Remove:

- The air filter assembly (*see corresponding operation*).
- The preheater plugs (*see corresponding operation*).

### Checks.

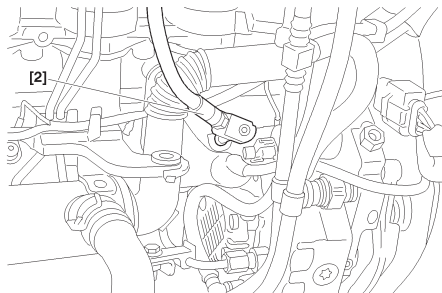
Fit the tool [2] on cylinder N°1, tighten to **1 m.daN**.

Connect tool [1] on tool [2].

Reconnect the positive and negative terminals of the battery.

Action the starter for **10 seconds** (*engine ECU disconnected*).

The value for the pressure in the cylinder should be **20 ± 5 bars** (*for a new engine*).



B1CPOF5D



# CHECKING THE ENGINE COMPRESSION RATES

Engines: 9HX - 9HY - 9HZ

## Checks (continued).

Remove tool [1] from tool [2].  
Remove the tool [2] from cylinder N°1.

Apply the same method to cylinders N°2, N°3 and N°4.

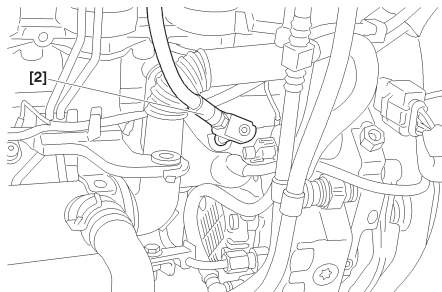
**NOTE:** The difference between any two cylinders should not be greater than **5 Bars**.  
Disconnect the battery.

**WARNING:** If the pressure values are low, check the condition of the air filter and of the cylinder head gasket before thinking of any engine overhaul.

## Additional operations.

Refit the preheater plugs, tighten to  $1 \pm 0,1 \text{ m.daN}$ .  
Complete the refitting in the opposite order to removal.

**IMPERATIVE:** Carry out the operations that are necessary following a reconnection of the battery (*see corresponding operation*).



B1CPOF5D

## ADJUSTING THE CAMSHAFT POSITION SENSOR

Engine: RHR

Tools.

[1] Setting peg for double flywheel

: (-).0188.X

### Adjusting the camshaft position sensor.

Peg the flywheel, using tool [1].

### Sensor re-used.

Position a drill bit  $\varnothing 8,5$  mm, at «e» (between the inlet valve cover (2) and the camshaft position sensor (5)).

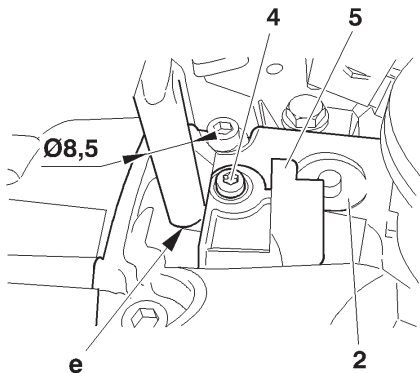
Tighten the screw (4) to  $2 \pm 0,2$  m.daN.

Remove tools [2] and [3].

### New sensor.

Place the camshaft position sensor (5) in contact with the target (camshaft pinion).

Tighten the screw (4) to  $2 \pm 0,2$  m.daN.



# CHECKING THE ENGINE COMPRESSION RATES

Engine: RHR

## Tools.

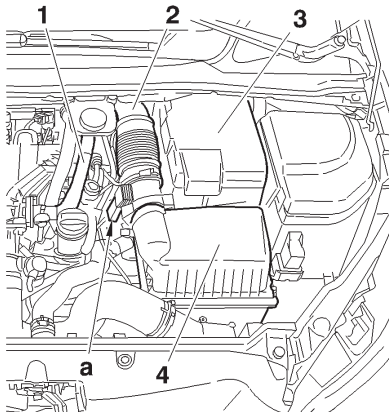
- [1] Compression meter : MULLER 203102-100
- [2] Dummy sparking plug : (-).0194.G

## Removing.

**IMPERATIVE:** Respect the safety and cleanliness requirements specific to High pressure Diesel injection (HDi) engine versions.

**WARNING:** After switching off the ignition, wait **15 minutes** before disconnecting the battery (to guarantee memorisation of the initialisations of the various ECUS).

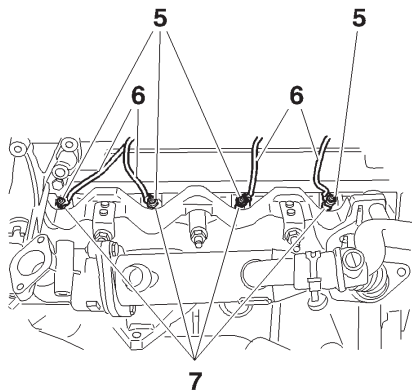
Remove the engine cover and the battery.  
Disconnect the negative terminal of the battery as well as the connector «a».  
Remove the air filter (4), the battery (3) and its support, the air duct (2) and the EGR tube (1).  
Move aside the **EGR** and coolant heater assembly (see corresponding operation).



B1BP355C

## CHECKING THE ENGINE COMPRESSION RATES

Engine: RHR



**NOTE:** Use a mirror to carry out the operations described below.

Remove the four nuts (5).

Move aside the supply wires (6).

Remove the preheater plugs (7).

Fit the tool [2] on cylinder N°1, tighten to **1 m.daN**.

**NOTE:** Use a mirror "a" to connect the flexible tube of tool [2] on the dummy sparking plug of the tool [2].

Connect tool [1] on tool [2].

Connect the battery negative cable.

Action the starter for **10 seconds** (*engine ECU disconnected*).

The value for the pressure in the cylinder should be **20 ± 5 Bars** (*for a new engine*).

Remove tool [1] from tool [2].

Remove the tool [2] from cylinder N°1.

Apply the same method to cylinders N°2, N°3 and N°4.

**NOTE:** The difference between any two cylinders should not be greater than **5 Bars**.

Disconnect the battery.

**Additional operations.**

Refit the preheater plugs, tighten to **1 ± 0,1 m.daN**.

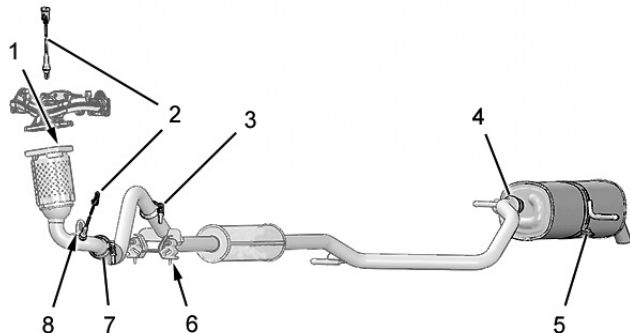
Complete the refitting in the opposite order to removal.

**IMPERATIVE:** Carry out the operations that are necessary following a reconnection of the battery (*see corresponding operation*).

B1BP33XC

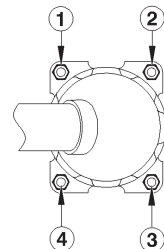
# TIGHTENING TORQUES - EXHAUST LINE

Engine: KFU



1	<b>Catalytic converter fixing nuts</b>	
	Pre-tightening	$2 \pm 0,2$
	Tightening	$4 \pm 0,4$
	Checking the tightening	$4 \pm 0,4$
2	<b>Oxygen sensor</b>	$4,7 \pm 0,7$
3	<b>Clip</b>	$2,5 \pm 0,3$
4	<b>Clip</b>	$2,5 \pm 0,3$
5	<b>Silencer</b>	$1,6 \pm 0,2$
6	<b>Fixing nut on subframe</b>	$0,75 \pm 0,2$
7	<b>Clip</b>	$2,5 \pm 0,3$
8	<b>Fixing nut engine block</b>	$2 \pm 0,7$

(1) Tightening sequence

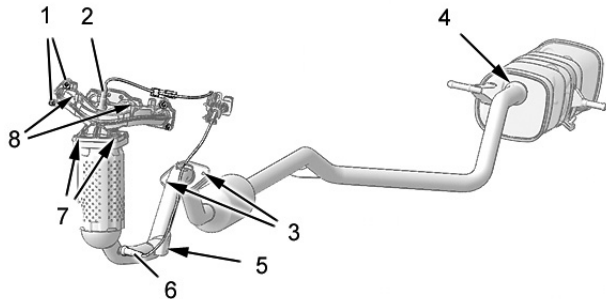


B1JP06ZD

B1JP070C

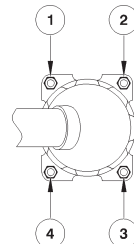
# TIGHTENING TORQUES - EXHAUST LINE

Engine: NFU



1	Exhaust manifold nuts	$2,3 \pm 0,4$
2	Upstream oxygen sensor	$4,7 \pm 0,5$
3	Nuts on front pipe / intermediate pipe	$1 \pm 0,2$
4	Clips	$2,5 \pm 0,3$
5	Screw on front pipe / clutch housing	$3,5 \pm 0,4$
6	Downstream oxygen sensor	$4,7 \pm 0,5$
7	Catalytic converter fixing nuts	
	Pre-tightening	$1,8 \pm 0,2$
	Tightening	$4 \pm 0,5$
	Checking the tightening	$4 \pm 0,5$
8	Heat shield nuts	$0,8 \pm 0,2$

(7) Tightening sequence

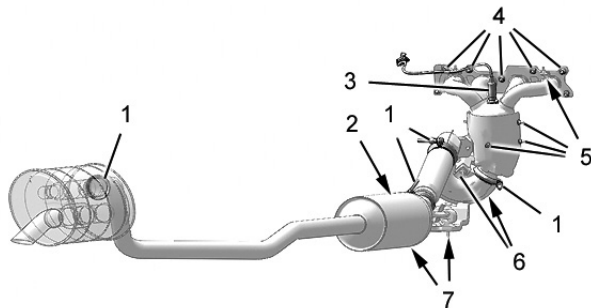


B1JP07DD

B1JP063C

# TIGHTENING TORQUES - EXHAUST LINE

Engine: RFJ

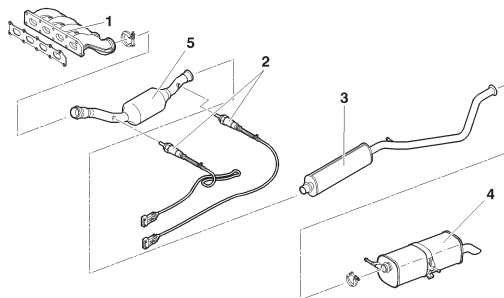


1	Clips	$2,5 \pm 0,3$
2	Downstream oxygen sensor	$4,7 \pm 0,5$
3	Upstream oxygen sensor	$4,7 \pm 0,5$
4	Exhaust manifold nuts	$3,5 \pm 0,4$
5	Heat shield nuts	$1,2 \pm 0,3$
6	Additional fixings	$1,5 \pm 0,2$
7	Flexible support nuts	$1 \pm 0,2$

B1JP078D

# EXHAUST SPECIFICATIONS

Engine: RFN



B1JP065D

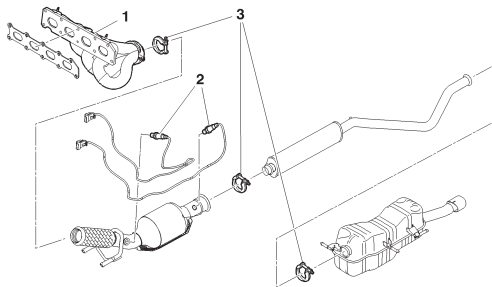
Engine type	(1) Exhaust manifold	(2) Upstream and downstream oxygen sensors	(3) Intermediate exhaust pipe clips	(4) Rear silencer clip	(5) Catalytic converter clip
	Tightening torques (m.daN)				
RFN	2,5 ± 0,2 (*)	4,7 ± 0,5		3,5 ± 0,5	
	3,5 ± 0,3 (**)				

(\*) = Tightening on heat shield. (\*\*) = Tightening except on heat shield.



# EXHAUST SPECIFICATIONS

Engine: RFK



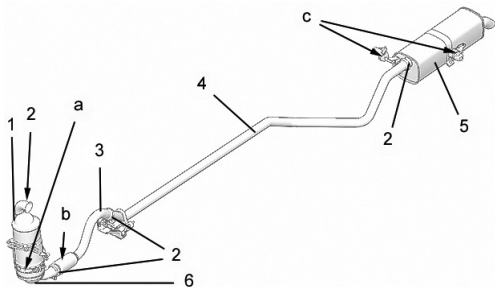
B1JP064D

Engine type	(1) Exhaust manifold	(2) Upstream and downstream oxygen sensors	(3) Clips
	Tightening torques (m.daN)		
RFK	2,5 ± 0,2 (*)	4,7 ± 0,5	2,5 ± 0,5
	3,5 ± 0,3 (**)		

(\*) = Tightening on heat shield. (\*\*) = Tightening except on heat shield.

# EXHAUST SPECIFICATIONS

Engine: 9HX



«a» Clip (*particle filter*)

«b» Flexible pipe

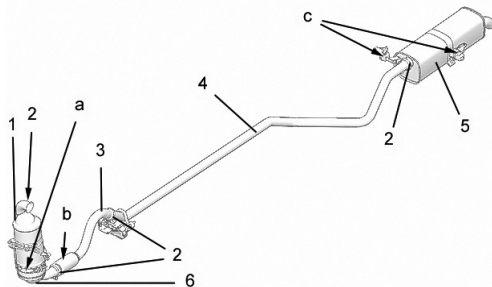
«c» Silencer fixing strap

B1JP076D

Engine type	(1) Catalytic converter		(2) Clip	(3) Front intermediate pipe	(4) Rear intermediate pipe	(5) Rear silencer	(6) Particle filter
	(Version EURO 3)	(Version EURO 4)					(Version EURO 4)
			Tightening (m.daN)				
			2,5 ± 0,3				
9HX	TR PSA K295	TR PSA K266				PSA 3051	TR PSA F007

# EXHAUST SPECIFICATIONS

Engines: 9HY - 9HZ



B1JP076D

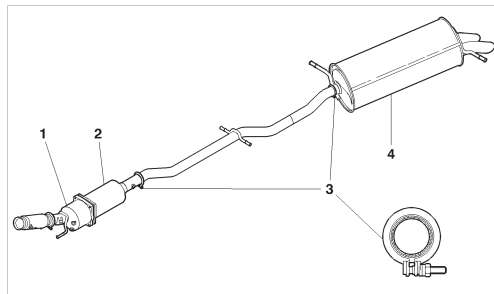
Engine types	(1) Catalytic converter		(2) Clip	(3) Front intermediate pipe	(4) Rear intermediate pipe	(5) Exhaust silencer	(6) Particle filter
	(Version EURO 3)	(Version EURO 4)					(Version EURO 4)
9HY - 9HZ	TR PSA K295	TR PSA K266				PSA 3051	TR PSA F007

Tightening (m.daN)

2,5 ± 0,3

# EXHAUST SPECIFICATIONS

Engine: RHR



B1JP06KD

Engine type	(1) Flexible pipe and catalytic converter	(2) Particle filter	(3) Tightening clip	(4) Rear silencer
			Tightening (m.daN)	
RHR	PSA K216	PSA F008	2,5 ± 0,3	PSA 3068

# EXHAUST SPECIFICATIONS

Engines: RFN - RFK - 9HX - 9HY - 9HZ - RHR

## Repair.

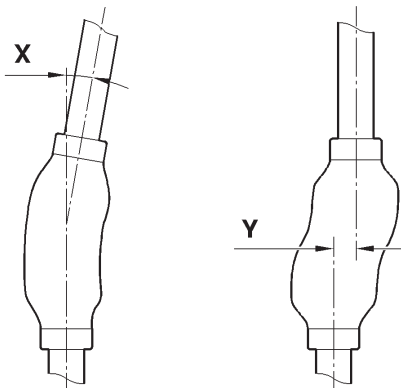
Take all the precautions when working on a vehicle.

The flexible pipe must not come into contact with corrosive products. Do not deform the flexible pipe more than **20° angular (X)**, **20 mm axial**, **25 mm shearing (Y)** (*flexible pipe not in place*).

Do not deform the flexible pipe more than **3° angular (X)**, **0 mm axial**, **3 mm shearing (Y)** (*flexible pipe in place*).

**WARNING:** Non respect of these precautions will shorten the life of the flexible pipe.

It is therefore imperative to disconnect or remove the exhaust line for any operations necessitating lifting of the engine-gearbox.



B1JP02JC

## COOLING SYSTEM SPECIFICATIONS

	Engines: KFU - NFU - RFJ - RFN - RFK				
	1.4i 16V	1.6i 16V	2.0i		2.0i 16V
Engine type	KFU	NFU	RFJ	RFN	RFK
Total capacity of the circuit	5,8	6,6 (*)	8,8	6,2 <b>(1)</b> – 6,6 <b>(2)</b>	6,6
				(*) 6,8 <b>(1)</b> – 6,9 <b>(2)</b>	
Radiator surface (dm²)	21				
Pressurisation (Bars)	1,4				
Opening of thermostatic regulator	89°C				
Alert	118°C				
Cooling fan	1x200 W		1x500 W	1x200 W	1x400 W
Thermistat tightening torque	1,7 ± 0,2				
Connector colour	Green				
Ring seal colour					

(\*) = Automatic gearbox. - (1) = Climate 37°C. - (2) = Climate 45°C.

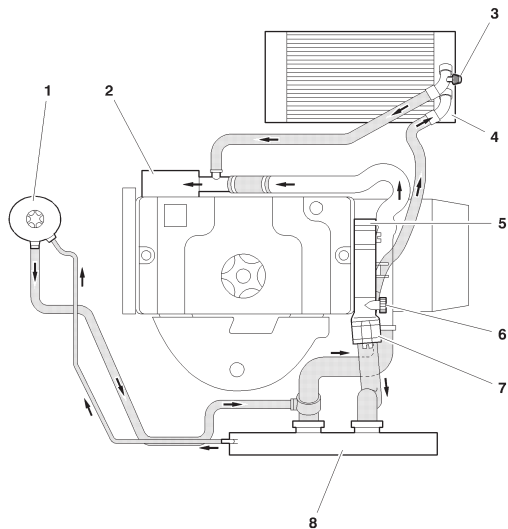
## COOLING SYSTEM SPECIFICATIONS

	Engines: 9HX - 9HY - 9HZ - RHR			
	1.6 16V HDi			2.0 16V HDi
Engine plate	9HX	9HY	9HZ	RHR
Capacity	6,5			8,1
Radiator surface (dm <sup>2</sup> )	21			
Pressurisation (Bars)	1,4			
Opening of thermostatic regulator	83°C			
Alert	118°C			
Post cooling	105°C (for 6 minutes)			6 minutes
Cooling fan	1x130W			1x150W
2-speed cooling fan				
1st speed	97°C (stop at 94°C)			97°C
2nd speed				105°C
3-speed cooling fan				
1st speed				97°C
2nd speed				101°C
3rd speed				105°C
Aircon cut-off	115°C			
Connector colour	Green			

(1) Version with additional heating.

# COOLING SYSTEM SPECIFICATIONS

Engine: KFU



(1) Header tank

(2) Coolant pump

(3) Bleed screw of heater matrix

(4) Heater matrix

(5) Coolant outlet housing

(6) Bleed screw of coolant outlet housing

(7) Thermostat

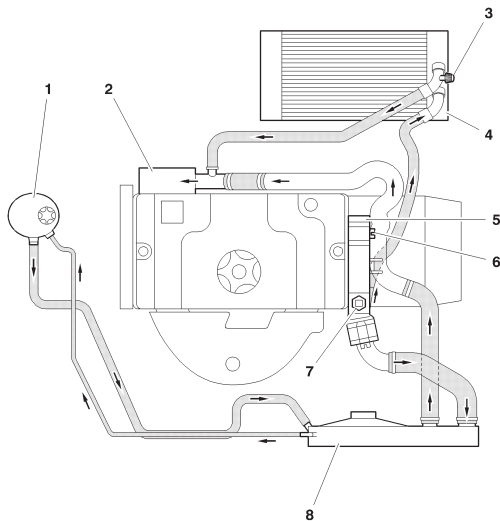
(8) Cooling radiator

B1GP0BWP



# COOLING SYSTEM SPECIFICATIONS

Engine: NFU Manual gearbox

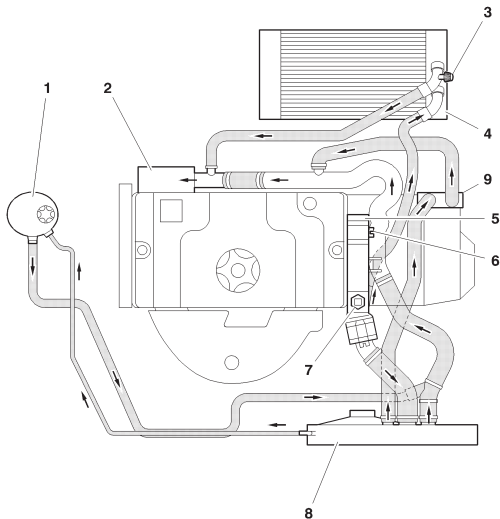


- (1) Header tank
- (2) Coolant pump
- (3) Bleed screw of heater matrix
- (4) Heater matrix
- (5) Coolant outlet housing
- (6) Bleed screw of coolant outlet housing
- (7) Calorstat
- (8) Cooling radiator

B1GP0CBP

# COOLING SYSTEM SPECIFICATIONS

Engine: NFU Automatic gearbox

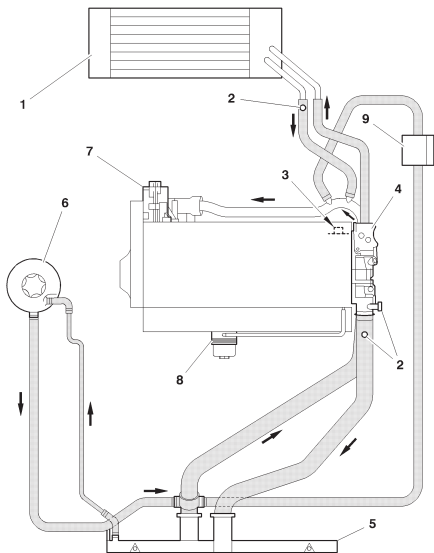


- (1) Header tank
- (2) Coolant pump
- (3) Bleed screw of heater matrix
- (4) Heater matrix
- (5) Coolant outlet housing
- (6) Bleed screw of coolant outlet housing
- (7) Calorstat
- (8) Cooling radiator
- (9) Heat exchanger (*automatic gearbox*)

B1GP0CCP

# COOLING SYSTEM SPECIFICATIONS

Engine: RFJ

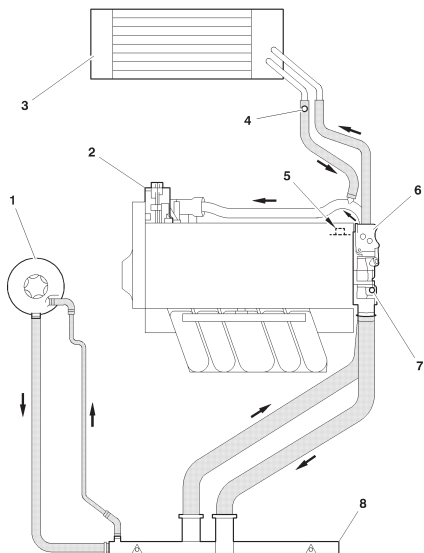


- (1) Heater matrix
- (2) Bleed screw
- (3) Cylinder block drain screw
- (4) Coolant outlet housing with piloted thermostatic regulator
- (5) Cooling radiator
- (6) Header tank
- (7) Coolant pump
- (8) Coolant/oil exchanger (*engine*)
- (9) Coolant/oil exchanger (*automatic gearbox*)

B1GP0CAP

# COOLING SYSTEM SPECIFICATIONS

Engine: RFN

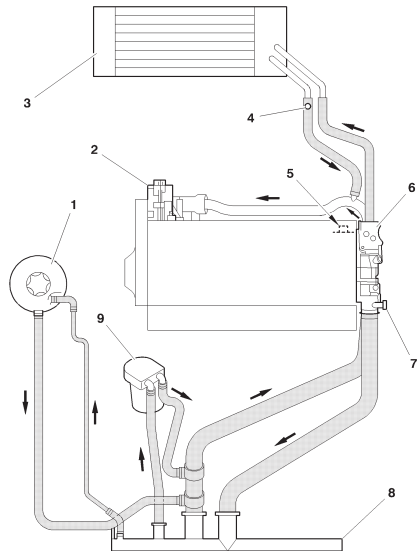


- (1) Header tank
- (2) Coolant pump
- (3) Heater matrix
- (4) Bleed screw of heater matrix
- (5) Cylinder block drain screw
- (6) Coolant outlet housing
- (7) Bleed screw of coolant outlet housing
- (8) Cooling radiator

B1GP0BYP

# COOLING SYSTEM SPECIFICATIONS

Engine: RFK

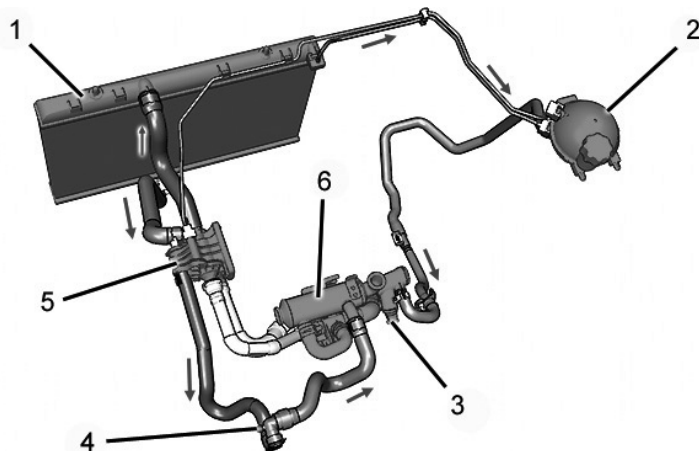


- (1) Header tank
- (2) Coolant pump
- (3) Heater matrix
- (4) Bleed screw of heater matrix
- (5) Cylinder block drain screw
- (6) Coolant outlet housing
- (7) Bleed screw of coolant outlet housing
- (8) Cooling radiator
- (9) Coolant/oil exchanger

B1GP0BUP

# COOLING SYSTEM SPECIFICATIONS

Engines: 9HX - 9HY - 9HZ



(1) Cooling radiator

(2) Header tank

(3) Assembly with drain plug (*all countries except very cold*)

(4) Bleed screw

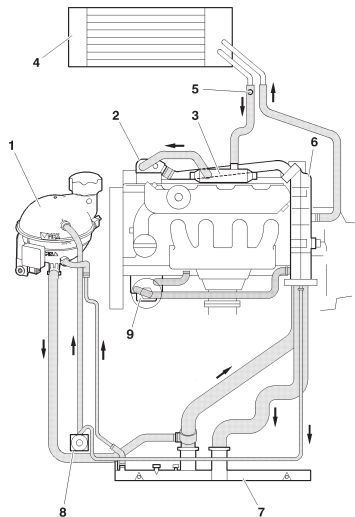
(5) Coolant outlet housing with thermostatic valve  
(*according to equipment*)

(6) Exhaust gas recycling (EGR) heat exchanger

B1GP0C9D

# COOLING SYSTEM SPECIFICATIONS

Engine: RHR



- (1) Header tank
- (2) Coolant inlet housing
- (3) Coolant / exhaust gas exchanger
- (4) Heater matrix
- (5) Bleed screw
- (6) Coolant outlet housing
- (7) Cooling radiator
- (8) Venting electrovalve
- (9) Coolant/oil heat exchanger

B1GP0COP

# **OIL FILTERS**

## **Petrol engines**

		<b>KFU</b>	<b>NFU</b>	<b>RFN</b>	<b>RFJ</b>	<b>RFK</b>
<b>MAHLE</b>		<b>X</b>				
<b>MAMELON</b>			<b>X</b>			
<b>MANN - HUMMEL</b>					<b>X</b>	
<b>MECAFILTER - MISFAT</b>				<b>X</b>		<b>X</b>
<b>PURFLUX</b>	<b>LS 923</b>			<b>X</b>		<b>X</b>

## **Diesel engines**

		<b>9HX</b>	<b>9HY</b>	<b>9HZ</b>	<b>RHR</b>
<b>MAHLE</b>		<b>X</b>	<b>X</b>		<b>X</b>
<b>PURFLUX</b>	<b>LS 923</b>				<b>X</b>

### **Specifications**

	<b>Ø (mm)</b>	<b>Height (mm)</b>
<b>MAHLE</b>	<b>65</b>	<b>80</b>
<b>MAMELON</b>	<b>27</b>	<b>28</b>
<b>MANN - HUMMEL</b>	<b>69</b>	<b>65</b>
<b>MECAFILTER - MISFAT</b>	<b>91</b>	<b>76</b>
<b>PURFLUX</b>	<b>76</b>	<b>89</b>



# OIL PRESSURE CHECKS

	Petrol					Diesel			
Engine type	KFU	NFU	RFJ	RFN	RFK	9HX	9HY	9HZ	RHR
Temperature (°C)	90°		80°						
Pressure (Bars)			1,5		3	1,3			1,9
RPM			1000						
Pressure (Bars)	3				5,6				4
RPM	2000				2000				2000
Pressure (Bars)			5		6,3				
RPM			3000		3000				
Pressure (Bars)	4					3,5			
RPM	4000					4000			
	Tools (Toolkit 4103)								
2279-T.Bis	X	X	X	X	X	X	X	X	X
(-).0710.F1			X						
(-).0710.B1			X						
(-).1503.J						X	X	X	
4103-T.B				X	X				
7001-T	X	X		X	X				X
4202-T				X	X				

**NOTE:** The oil pressure must be checked with the engine cold, after checking the oil level.

**NOTE:** The oil pressure warning lamp lights up at a threshold of **0.8 bar**.

# VALVE CLEARANCE SETTINGS

The valve clearances must be checked with the engine cold

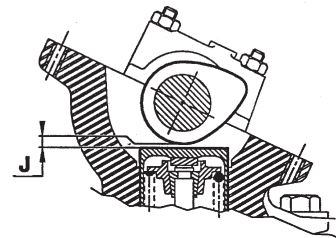
	● Inlet	⊗ Exhaust
KFU	Hydraulic adjustment	
NFU	1 ± 0,05 mm	1 ± 0,05 mm
RFN RFJ RFK	Hydraulic adjustment	
9HX 9HY 9HZ RHR		

## POSSIBLE PROCEDURES

For engines with 4 cylinders in a line (1-3-4-2)

Rocking			Fully open (Exhaust)	
Rocking	Adjust		Valves fully open	Adjust
1 ● ⊗ 1	4 ● ⊗ 4	⊗ Inlet  ● Exhaust	⊗ 1	3 ● ⊗ 4
3 ● ⊗ 3	2 ● ⊗ 2		⊗ 3	4 ● ⊗ 2
4 ● ⊗ 4	1 ● ⊗ 1		⊗ 4	2 ● ⊗ 1
2 ● ⊗ 2	3 ● ⊗ 3		⊗ 2	1 ● ⊗ 3

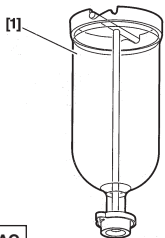
Engines without hydraulic adjustment: the clearance (J) should be checked opposite the cam.



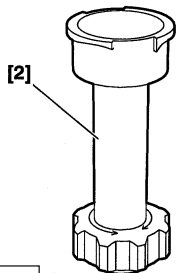
B1DP13QC

# FILLING AND BLEEDING THE COOLING CIRCUIT

Engines: KFU - NFU - RFJ - RFN - RFK - RHR



B1GP00AC



E5AP1GNC

## Tools.

- [1] Filling cylinder : 4520-T
- [2] Adaptor for filling cylinder : 4222-T
- [3] Control rod for filling cylinder : 4370-T

**IMPERATIVE: Respect the safety and cleanliness requirements.**

The draining and refilling operations can be carried out using coolant fluid replacement equipment.

**It is essential to follow the instructions as stated for that equipment.**

## Draining.

- Remove the header tank cap.
- Uncouple the radiator bottom hose.
- Remove the drain screw from the cylinder block.

## Filling and bleeding.

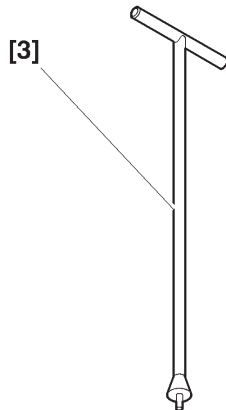
Open the bleed screws of the following components:

- Heater matrix outlet.
- Coolant outlet housing.

Connect the radiator bottom hose.

Fit the drain screw on the cylinder block (*screw equipped with a new seal*).

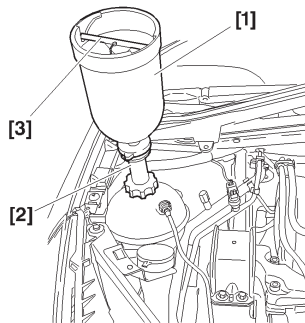
Tighten to **3 ± 0,3 m.daN**.



E5AP2CNC

## FILLING AND BLEEDING THE COOLING CIRCUIT

Engines: KFU - NFU - RFJ - RFN - RFK - RHR



Fit the filling cylinder [1] and adaptor [2] assembly on the filling orifice.

Fill the cooling circuit.

**NOTE:** Keep the filling cylinder full to the maximum.

Start the engine.

Maintain an engine speed of **1600 rpm**, up to the first cooling cycle (*starting and stopping of the cooling fan*).

Close each bleed screw as soon as the liquid starts to flow out without air bubbles.

Stop the engine.

Plug the filling cylinder [1], using the control rod [3].

Remove the filling cylinder [1], control rod [3] and adaptor [2] assembly.

Refit the header tank cap.

### Checks.

Start the engine.

Maintain an engine speed of **1600 rpm**, up to the first cooling cycle (*starting and stopping of the cooling fan*).

Stop the engine and wait for it to cool down.

Remove the header tank cap.

If necessary, top up the level to the maximum mark.

Refit the header tank cap.

IDLING - DEPOLLUTION								
Vehicles		Engine type	Emission standard	Make - Injection type	Idling speed (± 50 rpm)		% Content	
					Manual gearbox	Auto. gearbox: N gear engaged	CO	CO2
C4	1.4i 16V	KFU	Euro 4	MAGNETTI - MARELLI 6LP	850		< 0,5	> 0,9
	1.6i 16V	NFU	Euro 4	BOSCH ME7.4.5				
	2.0i 16V	RFN	IF Euro 4	MAGNETTI - MARELLI 6LP				
	2.0i	RFJ	Euro 4					
	2.0i 16V	RFK	IF Euro 4					

# PETROL INJECTION

	C4				
	1.4i 16 V	1.6i 16 V	2.0i 16 V	2.0i	2.0i 16 V
Engine type	KFU	NFU	NFU	RFJ	RFK
Emission standard	Euro 4	Euro 4	IF Euro 4	Euro 4	IF Euro 4
Make Injection type	MAGNETTI MARELLI 6LP	BOSCH ME7.4.5	MAGNETTI MARELLI 6LP	MAGNETTI MARELLI 6LP	MAGNETTI MARELLI 6LP
Fuel pressure (bars)	3,5				
Overspeed cut-off (rpm)	6000				
Cut-in speed (rpm)		5500			
Injector resistive value (ohms)	14,5 ± 0,5 at 20°C				
Coolant temperature sensor resistive value (ohms)	9950 at 10°C	6245 at 20° C	1801,5 at 50°C	458,85 at 90° C	
Resistance (ohms)	-	Stepper motor: 53	Butterfly housing: 5600		
Air temperature sensor resistive value (ohms)	3 820 at 10°C	2509 at 20° C	810 at 50°C	231 at 90° C	

INJECTION

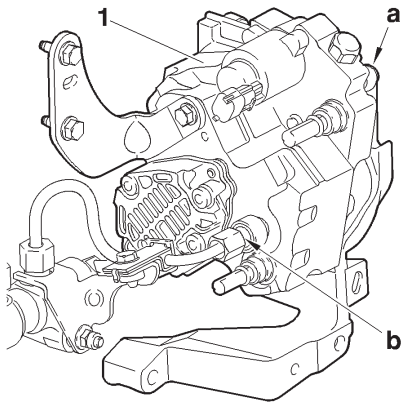
EMISSION STANDARDS							
STANDARD				APPLICATIONS		NOTES	CHARACTERISTICS
E.E.C.	PSA		Engines	Vehicles	Applicable		
	A/S	RP					
EURO 3	L4	E.E.C. 2000	Petrol Diesel Gas	Private vehicles: All Types • new models • existing models	01/2000 → 01/2001 →	Brussels Directive 98/69  → EURO 2 standard (L3) made stricter → Fiscal incentives	With 2 oxygen sensors and catalytic converter for petrol vehicles. With catalytic converter and EGR for diesel vehicles.  With EOBD on-board diagnosis.
EURO 4	L5		Petrol	Private vehicles: All Types • new models • existing models	01/2005 → 01/2006 →	Directives 2001/100B/CE:  → EURO 3 standard (L4) made stricter → Fiscal incentives	With 2 oxygen sensors and catalytic converter for petrol vehicles.  With EOBD on-board diagnosis.

EMISSION STANDARDS							
STANDARD			APPLICATIONS			NOTES	CHARACTERISTICS
E.E.C.	PSA		Engines	Vehicles	Applicable		
	A/S	RP					
EURO 3	L5		Petrol Diesel Gas	Private vehicles: All Types • new models • existing models	01/2005 → 01/2006 →	Directives 2001/100B/CE:  → EURO 3 standard (L4) made stricter → Fiscal incentives	With 2 oxygen sensors and catalytic converter for petrol vehicles.  With EOBD on-board diagnosis.
EURO 4	L5		Petrol Gas	Utility vehicles: < 3.5 tonnes Class 1: • new models • existing models Class 2/3: • new models • existing models	01/2005 → 01/2006 → 01/2006 → 01/2007 →	Directives 2001/100B/CE: → EURO 3 standard (L4) made stricter → Fiscal incentives → 3 classes depending on vehicle weight: Class 1 < 1305 kg Class 2 : 1305/1760 kg Class 3 : 1760 kg	With 2 oxygen sensors and catalytic converter for petrol vehicles.  With EOBD on-board diagnosis.



EMISSION STANDARDS							
STANDARD				APPLICATIONS		NOTES	CHARACTERISTICS
E.E.C.	PSA		Engines	Vehicles	Applicable		
	A/S	RP					
IF EURO 4	IF/L5		Petrol	Private vehicles: All Types • new models • existing models	01/2005 → 01/2006 →	Directives 2001/100A/CE:  → Fiscal incentives	With 2 oxygen sensors and catalytic converter for petrol vehicles.  With EOBD on-board diagnosis.
IF EURO 4	IF/L5		Petrol Diesel Gas	Private vehicles: All Types • new models • existing models	01/2005 → 01/2006 →	Directives 2001/100A/CE:  → Fiscal incentives	With 2 oxygen sensors and catalytic converter for petrol vehicles.  With EOBD on-board diagnosis.

EMISSION STANDARDS							
STANDARD			APPLICATIONS			NOTES	CHARACTERISTICS
E.E.C.	PSA		Engines	Vehicles	Applicable		
	A/S	RP					
IF EURO 4	IF/L5		Petrol Gas	Utility vehicles: < 3.5 tonnes Class 1: • new models • existing models Class 2/3: • new models • existing models	01/2005 → 01/2006 → 01/2006 → 01/2007 →	Directives 2001/100A/CE: → Fiscal incentives → 3 classes depending on vehicle weight: Class 1 < 1305 kg Class 2 : 1305/1760 kg Class 3 : 1760 kg	With 2 oxygen sensors and catalytic converter for petrol vehicles.  With EOBD on-board diagnosis.

**PROHIBITED OPERATIONS: BOSCH HDi DIRECT INJECTION SYSTEM****Engines: 9HX - 9HY - 9HZ**

B1HP1TVC

**Cleaning.**

- The use of high pressure cleaners is prohibited.
- Do not use compressed air.

**Fuel supply circuit.**

- Required fuel: diesel.

**Electrical circuit.**

- Swapping injection ECUS between two vehicles will render it impossible to start either vehicle.
- It is forbidden to supply a diesel injector with 12 volts.

**Fuel high pressure pump.**

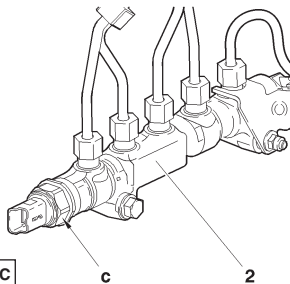
Do not separate the fuel high pressure pump **(1)** from the following components:

- Sealing ring **(a)** (*no replacement parts*).
- High pressure outlet connector **(b)** (*will cause a malfunction*).

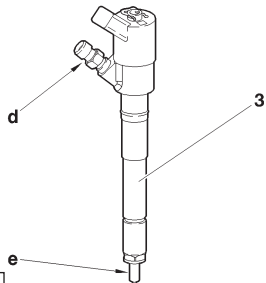
**PS: HDi = High pressure Direct diesel injection.**

## PROHIBITED OPERATIONS: BOSCH HDi DIRECT INJECTION SYSTEM

Engines: 9HX - 9HY - 9HZ



B1HP1TWC



B1HP1TXC

**Fuel high pressure injection common rail.**

Do not separate the unions «c» from the injection common rail **(2)** (*risk of malfunction*).

**Diesel injectors.**

**WARNING: Diesel and ultrasonic cleaners are prohibited.**

Do not separate the diesel injector carrier **(3)** from the following components:

- Diesel injector **(e)** (*no replacement parts*).
- Electromagnetic component **(d)** (*no replacement parts*).

It is forbidden to clean the carbon deposits from the diesel injector nozzle.

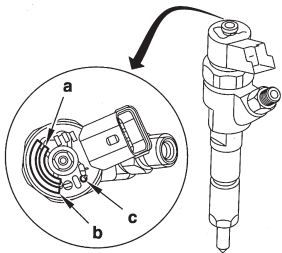
**PS: HDi = High pressure Direct diesel injection.**

# PROHIBITED OPERATIONS: BOSCH HDi DIRECT INJECTION SYSTEM

Engines: 9HX - 9HY - 9HZ

## Identification: Injector carrier

There are two types of diesel injector carrier classed according to fuel flow.



## Identification by engraving or paint mark

Injector carrier	Engraving	Paint mark	Location
<b>Class 1</b>	<b>1</b>	<b>Blue</b>	On the upper part of the coil near to the fuel return aperture
<b>Class 2</b>	<b>2</b>	<b>Green</b>	

## Identification markings:

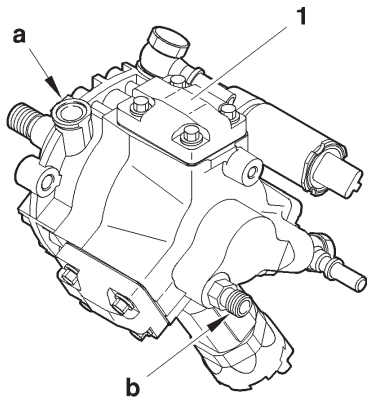
- «a»: Supplier identification.
- «b»: PSA identification number.
- «c»: Class identification.

**IMPERATIVE:** When replacing a diesel injector carrier, order a component of the same class (*see repair manual*).

B1HP16PC

## PROHIBITED OPERATIONS: BOSCH HDi DIRECT INJECTION SYSTEM

Engine: RHR



### Cleaning.

- The use of **high pressure** cleaners is prohibited.
- Do not use compressed air.

### Fuel supply circuit.

- Required fuel: diesel.

### Electrical circuit.

- Swapping injection ECUS between two vehicles will render it impossible to start either vehicle.
- It is forbidden to supply a diesel injector with **12 volts**.

### Fuel high pressure pump.

Do not separate the fuel high pressure pump **(1)** from the following components:

- Sealing ring **(a)** (*no replacement parts*).
- High pressure outlet connector **(b)** (*will cause a malfunction*).

**PS: HDi = High pressure Direct diesel injection.**

B1HP1K9C

# PROHIBITED OPERATIONS: BOSCH HDi DIRECT INJECTION SYSTEM

Engine: RHR

Diesel injectors.

**WARNING: Diesel and ultrasonic cleaners are prohibited.**

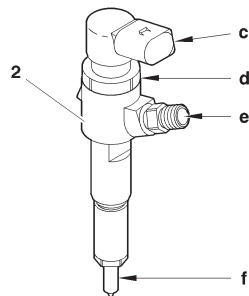
Do not separate the diesel injector carrier **(2)** from the following components:

- Diesel injector **(f)** (*no replacement parts*).
- Electromagnetic component **(c)** (*no replacement parts*).

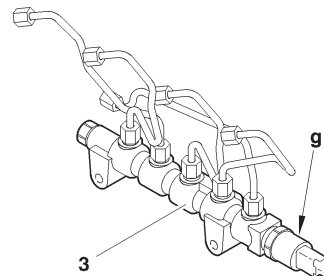
Do not move the nut «**d**» (*will cause a malfunction*).

Do not separate the union «**e**» from a diesel injector.

It is forbidden to clean the carbon deposits from the diesel injector nozzle.



B1HP1KAC



B1HP1KBC

## SAFETY REQUIREMENTS: HDi DIRECT INJECTION SYSTEM

Engines: 9HX – 9HY – 9HZ – RHR

### SAFETY REQUIREMENTS.

#### Preamble.

All interventions on the injection system must be carried out to conform with the following requirements and regulations:

- Competent health authorities.
- Accident prevention.
- Environmental protection.

**WARNING:** Repairs must be carried out by specialised personnel informed of the safety requirements and of the precautions to be taken.

#### Safety requirements.

**IMPERATIVE:** Take into account the very high pressures in the high pressure fuel circuit (1350 bars), and respect the requirements below:

- No smoking in proximity to the high pressure circuit when work is being carried out.
- Avoid working close to flame or sparks.

#### Engine running:

- Do not work on the high pressure fuel circuit.
- Always stay clear of the trajectory of any possible jet of fuel, which could cause serious injuries.
- Do not place your hand close to any leak in the high pressure fuel circuit.

After the engine has stopped, wait **30 seconds** before any intervention.

**NOTE:** This waiting time is necessary in order to allow the high pressure fuel circuit to return to atmospheric pressure.



## SAFETY REQUIREMENTS: HDi DIRECT INJECTION SYSTEM

Engines: 9HX – 9HY – 9HZ – RHR

### CLEANLINESS REQUIREMENTS.

#### Preliminary operations.

**IMPERATIVE: The technician should wear clean overalls.**

Before working on the injection system, it may be necessary to clean the apertures of the following sensitive components:  
*(refer to corresponding procedures)*

- Fuel filter.
- Fuel high pressure pump.
- Third piston deactivator.
- High pressure regulator.
- High pressure sensor.
- High pressure fuel injection common rail.
- High pressure fuel pipes.
- Diesel injector carriers.

**IMPERATIVE: After dismantling, immediately block the apertures of sensitive components with plugs, to avoid the entry of impurities.**

#### Work area.

- The work area must be clean and free of clutter.
- Components being worked on must be protected from dust contamination.

## PARTICLE FILTER SAFETY AND CLEANLINESS REQUIREMENTS

### General.

**ESSENTIAL:** Given the very high pressures prevailing in the fuel high pressure circuit (1600 Bars), respect the following regulations.

- It is forbidden to smoke in the immediate proximity of the high pressure circuit during a repair.
- Avoid working close to flames or sparks.

### **When the engine is running:**

- Do not touch the fuel high pressure circuit.
- Always keep out of range of possible projections of fuel, which could cause serious injuries.
- Do not place your hand near to any leak on the fuel high pressure circuit.
- After the engine has stopped, wait 30 seconds before starting any operation.

**NOTE:** The waiting time is necessary to allow the fuel high pressure circuit to return to atmospheric pressure.

### Safety rules.

**IMPERATIVE:** Wait at least an hour before starting any repair on the exhaust line.

### **Forced regeneration of the particle filter:**

Check that there are no aerosols or inflammable products inside the vehicle's boot.

Wear high temperature gloves.

Connect the vehicle to a gas extractor approved for this type of operation.

**IMPERATIVE:** In the absence of the required installations, carry out the forced regeneration of the particle filter outside the workshop, in a concreted area well away from any inflammable materials. Place the vehicle in the high position.

## PARTICLE FILTER SAFETY AND CLEANLINESS REQUIREMENTS

### Operations on the fuel additive circuit.

**IMPERATIVE:** For all operations on the additive circuit, wear protective goggles and gloves that are resistant to hydrocarbons. The work area must be ventilated.

### **In the event of any significant dispersion of additive:**

- Wear a breathing mask for filtering the particles.
- Recover as much of the product as possible.
- Place the product thus recovered in an appropriately labelled container.
- Wash the soiled area with copious amounts of water.
- Dispose of materials and solid residues in an authorised recovery point.

**IMPERATIVE:** The filling kit should be recycled following a repair. All «Eolys» additive containers that have been opened should be disposed of.

### Cleanliness rules.

**ESSENTIAL:** The operator should wear clean overalls.

Before working on the injection circuit, it may be necessary to clean the unions of the following sensitive components (*see corresponding operations*):

- Fuel filter.
- Fuel high pressure pump.
- Fuel high pressure regulator.
- Fuel high pressure common injection rail.
- Fuel high pressure piping.
- Diesel injector carriers.

**IMPERATIVE:** After dismantling, immediately blank the unions of the sensitive components with plugs, to prevent any ingress of impurities.

## SPECIAL FEATURES: FORCED REGENERATION OF THE PARTICLE FILTER

### Tools.

Diagnostic stations

: LEXIA or PROXIA.

**Imperative:** Respect the safety and cleanliness requirements.

### Forced regeneration of the particle filter.

**IMPERATIVE:** Respect the safety and cleanliness requirements specific to HDi engines.

**ESSENTIAL:** Connect the vehicle to a gas extractor approved for this type of operation.

In the absence of the required installations, carry out the forced regeneration of the particle filter outside the workshop, in a concreted area well away from any inflammable materials. Place the vehicle in the high position.

**WARNING:** Check that the fuel level is sufficient (*at least 20 litres*).

Start the engine and allow it to warm up (*60°C minimum*).

Connect the diagnostic tool to the vehicle's central socket.

Trigger the regeneration cycle, with the diagnostic tool.

### Automatic running of the regeneration cycle of the particle filter.

Autocheck by the engine ECU.

Stabilisation of engine speed at **4000 rpm**, operating with post injection.

Change to idling speed (*for 30 seconds*).

Stabilisation of engine speed at **3000 rpm**, checking of the efficiency of the regeneration of the particle filter.

Change to idling speed.

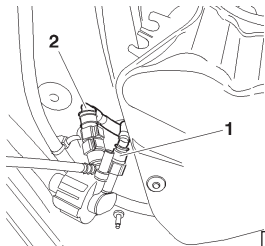
**NOTE:** Let the engine run at idling speed for the benefit of cooling.

Stop the engine.

**IMPERATIVE:** Wait for at least an hour before any operation on the exhaust line.

## SPECIAL FEATURES: ADDITIVE SYSTEM

### Filling the additive reservoir



B1HP20VC

**Imperative: Respect the safety and cleanliness requirements.**

#### Tools.

Diagnostic stations

: LEXIA or PROXIA

Filling kit for 1 litre, comprising the following items:

- 1 Container of Eolys

- 2 Filters

- 2 Tubes

- 2 Hooks

- 1 Adaptor

#### Filling.

**IMPERATIVE: Respect the safety and cleanliness requirements specific to HDi engines.**

**IMPERATIVE: For all operations on the additive circuit, wear protective goggles and gloves that are resistant to hydrocarbons.**

Place the vehicle on a lift.

Disconnect the battery negative terminal.

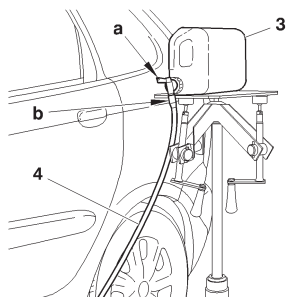
Unclip the factory filler connector (1).

Uncouple the tube (2).

Couple the container of additive to the tube (2) using the adaptor and the tube (*with tap*) from the filling kit.

Screw the filler connector on the additive container (3) at «b».

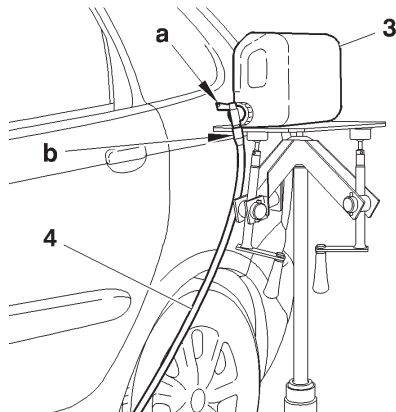
Place the additive container (3) on the component lift.



C4BP1EGC

## SPECIAL FEATURES: ADDITIVE SYSTEM

### Filling the additive reservoir (continued)



Open the tap located on the filler connector at «a».  
Tilt the additive container (3) *(to facilitate the end of filling)*.  
Close the tap at «a».

Remove:

- The filler connector .
- The tube (4).

Couple the tube (2).

Reconnect the battery negative terminal.

**IMPÉRATIVE:** Reset the additive counters to zero, using a diagnostic tool.

Cleanliness requirements.

**IMPERATIVE:** The filling kit should be recycled after this operation. Any «Eolys» additive containers that have been opened should not be kept.

## SPECIAL FEATURES: CHECKING THE ADDITIVE LEVEL

**IMPERATIVE:** Respect the safety and cleanliness requirements.

### Preliminary operation.

Place the vehicle on a **2-column** lift.

Raise and support the vehicle.

Remove:

- The heat shield from the additive reservoir.
- The additive reservoir (*see corresponding operation*).

### Checks.

Empty the reservoir into a clean glass container.

Measure the quantity of additive and compare it with the table below.

Distance travelled by the vehicle		Quantity of additive taken from the additive reservoir (Litres)	
Kilometres	Miles	9HY - 9HZ	RHR
0	0	2,2 + 0,2	2,8 + 0,2
30 000	18 750	1,17 + 0,2	2,17 + 0,2
60 000	37 500	1,25 + 0,2	1,55 + 0,2
90 000	56 250	0,77 + 0,2	0,92 + 0,2
120 000	75 000	0,3 + 0,2	0,3 + 0,2

### Additional operation.

Refit the additive reservoir (*see corresponding operation*).

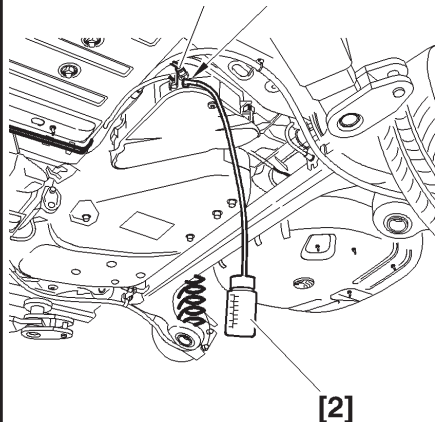
Top up the additive reservoir.

Refit the heat shield to the additive reservoir.

Perform the actuator test «**filling the tube: additive pump - additive injector**» using **LEXIA** or **PROXIA**.

## SPECIAL FEATURES: ADDITIVE SYSTEM

### Checking the additive pump pressure and the sealing of the additive injector



C4BP1G6C

#### Tools.

- |                                 |               |          |
|---------------------------------|---------------|----------|
| [1] Manual pressure/vacuum pump | : FACOM DA 16 |          |
| [2] Additive container          | : (-).1613.G  | Kit 1613 |

**IMPERATIVE:** Respect the safety and cleanliness requirements.

#### Checks.

**IMPERATIVE:** Respect the safety and cleanliness requirements specific to HDi engines.

**IMPERATIVE:** For all operations on the additive circuit, wear protective goggles and gloves that are resistant to hydrocarbons.

Place the vehicle on a lift.

Raise the vehicle.

To test the flow of the additive pump:

- Uncouple the tube (1).
- Couple tool [2] on the outlet «a» of the additive reservoir.
- Operate for **50 seconds** the actuator test «**Additive pump**» with the aid of **LEXIA** or **PROXIA**.

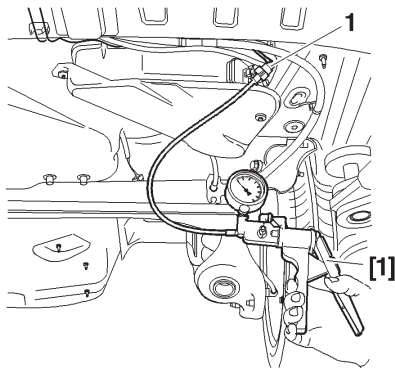
**IMPERATIVE:** The volume collected by the tool [2] should be  $20 \pm \text{ml}$ .

**NOTE:** Replace the additive pump if it is defective.

Couple the tube (1).

Perform the actuator test «**filling the tube: additive pump - additive injector**» using **LEXIA** or **PROXIA**.



**SPECIAL FEATURES: ADDITIVE SYSTEM****Checking the additive pump pressure and the sealing of the additive injector****Sealing of the additive injector.**

Couple tool [1] to the tube (1).

Action the manual pump [1].

**WARNING:** The additive injector should open at a pressure of  $100 \pm 20$  Bars.

Action the manual pump in vacuum [1] at **800 m.bars**.

**WARNING:** The value must not fall rapidly.

**NOTE:** Replace the fuel tank if the additive injector is defective.

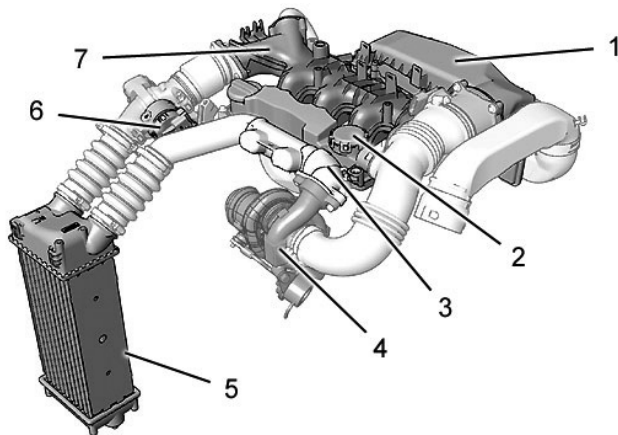
Couple the tube (1).

Perform the actuator test «**filling the tube: additive pump - additive injector**», using **LEXIA** or **PROXIA**.

C4BP1G7C

## AIR SUPPLY CIRCUIT SPECIFICATION

Engine: 9HX



(1) Air filter assembly

(2) Oil trap

(3) Turbocharger resonance attenuator

(4) Turbocharger

(5) Air/air exchanger

(6) Air metering device

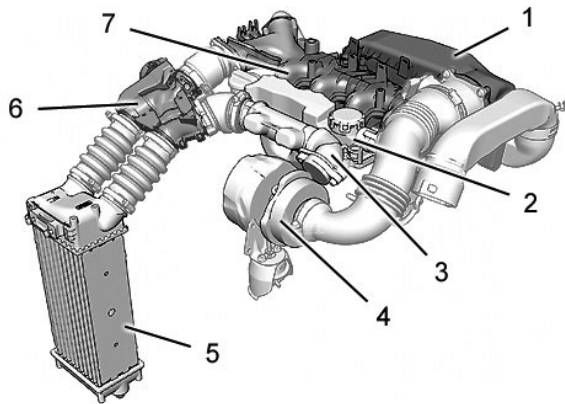
(7) Air distributor

Air filter : MARK 4

Turbocharger : MHI TD025S2

**AIR SUPPLY CIRCUIT SPECIFICATION**

Engines: 9HY - 9HZ



- (1) Air filter assembly
- (2) Oil trap
- (3) Turbocharger resonance attenuator
- (4) Turbocharger
- (5) Air/air exchanger
- (6) Double butterfly air metering device (EURO 4 version)
- (7) Air distributor

Air filter : **MARK 4**Turbocharger : **GARRET GT 1544V**

B1HP22FD

## CHECKING THE AIR SUPPLY CIRCUIT

Engine: 9HX

Tools.

: FACOM DA 16

[1] Manual pressure-vacuum pump

### Checks.

#### **Vacuum pump.**

Connect the tool [1] onto the vacuum pump (1).

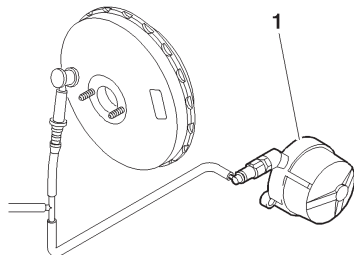
Start the engine.

The vacuum value should be  **$0.9 \pm 0.1$  bar** at idle (*after 30 seconds of operation*).

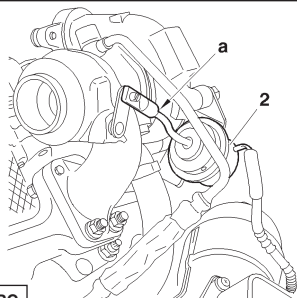
**NOTE:** The exhaust gas recycling valve is not linked to the air supply circuit.  
The exhaust gas recycling electrovalve is controlled by the engine ECU.

#### **Turbocharging pressure regulation valve.**

- Connect the tool [1] on the valve (2).
- Apply a vacuum of approx. **0.8 bar**.
- Rod "a" should move  **$6 \pm 2$  mm**.



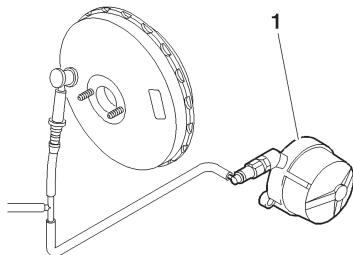
B1HP1UGC



B1HP22RC

## CHECKING THE AIR SUPPLY CIRCUIT

Engines: 9HY - 9HZ



B1HP1UGC

## Tools.

[1] Manual pressure-vacuum pump

: FACOM DA 16

Checks.**Vacuum pump.**

Connect the tool [1] onto the vacuum pump (1).

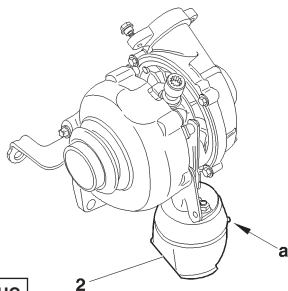
Start the engine.

Wait **30 seconds**.The vacuum value should be  **$0.9 \pm 0.1$  bar** at idle.

**NOTE:** The exhaust gas recycling valve is not linked to the air supply circuit.  
The exhaust gas recycling electrovalve is controlled by the engine ECU.

**Turbocharging pressure regulation valve.**

- Connect the tool [1] on the valve (2) (*tube identified by the colour grey*).
- Apply a vacuum of approx. **0.8 bar**.
- Rod "a" should move  **$12 \pm 2$  mm**.



B1HP1UHC

## CHECKS: TURBO PRESSURE

Engines: 9HX - 9HY - 9HZ

**IMPERATIVE:** Respect the safety and cleanliness requirements.

**Preparation.**

**IMPERATIVE:** Respect the following test conditions:

- Engine at operating temperature.
- Vehicle in running order.
- Engine under full load.

Connect the diagnostic tool to the vehicle's diagnostic socket, carry out parameter measures.

**Mode of operation.**

Start the engine.

Engage first gear, start the vehicle.

Engage the gears up to **third gear**.

Decelerate to an engine speed of **1000 rpm**.

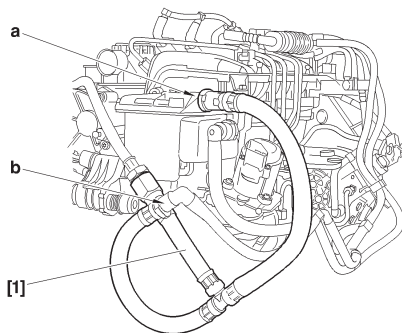
Check the pressure:  **$0,6 \pm 0,05$  bar (1500 rpm)**.

Accelerate freely (*change from **fourth gear** to **third gear***).

Check the pressure:  **$0,9 \pm 0,05$  bar (between 2500 and 3500 rpm)**.

## CHECKS: LOW PRESSURE FUEL SUPPLY CIRCUIT

Engines: 9HX - 9HY - 9HZ



B1CP0GFD

## Tools.

- [1] Ø 10 mm low pressure connector : 4215-T  
 [2] Pressure gauge for testing boost pressure : 4073-T.A      Toolkit 4073-T

**IMPERATIVE:** Respect the safety and cleanliness specific to high pressure diesel injection engines.

**Remove the air filter duct.**

Link tool [1] in series, downstream of the injectors, between the fuel high pressure pump and the fuel filter at «a» and «b».

**WARNING:** Any checking of pressure downstream of the fuel filter is prohibited.  
 Switch on the ignition.

Check the pressure:  
 - Vacuum measured by the pressure gauge [2].

**Checks.**

- |               |   |
|---------------|---|
| 10 ± 0,5 cmHg | : Engine driven by the starter motor.                                     |
| 20 ± 0,5 cmHg | : Engine running under full load.   |
| 60 ± 0,5 cmHg | : Supply circuit obstructed<br>(full tank strainer, piping, fuel filter). |

## CHECKING THE AIR SUPPLY CIRCUIT

Engine: RHR

Tools.

[1] Manual pressure-vacuum pump

: FACOM DA 16

**IMPERATIVE:** Respect the safety and cleanliness specific to high pressure diesel injection engines.

**WARNING:** After switching off the ignition, wait **15 minutes** before disconnecting the battery (to guarantee memorisation of the initialisations of the different ECUS).

**Checking the vacuum source (vacuum pump).**

Connect the tool [1] on the take-off «a».

Start the engine.

The value should be

:  $1 \pm 0,2$ .

**Turbocharging pressure electrovalve.**

Connect the tool [1] on the vacuum supply «b» of the electrovalve (1).

Start the engine.

The value should be

:  $1 \pm 0,2$ .

**Cold air circuit electrovalve.**

Connect the tool [1] on the vacuum supply «c» of the electrovalve (2).

Start the engine.

The value should be

:  $1 \pm 0,2$ .

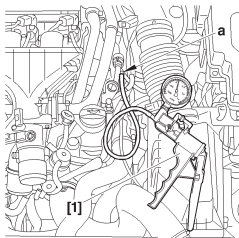
**Warm air circuit electrovalve.**

Connect the tool [1] on the vacuum supply «d» of the electrovalve (3).

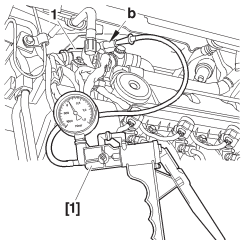
Start the engine.

The value should be

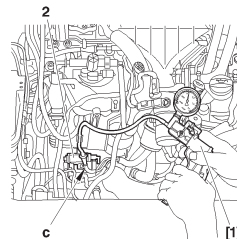
:  $1 \pm 0,2$ .



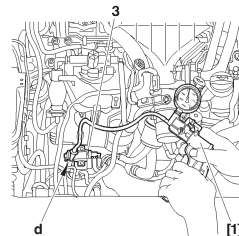
B1BP33ZC



B1BP340C



B1BP341C

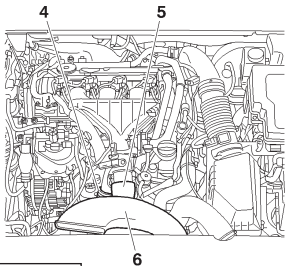


B1BP342C

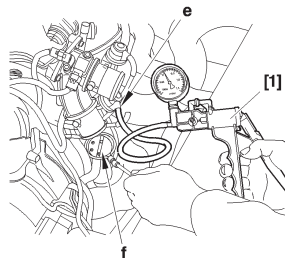


## CHECKING THE AIR SUPPLY CIRCUIT

Engine: RHR



B1BP343C



B1BP344C

## Checking the warm air opening.

## Remove:

- The air duct (4).
- The air duct (5).
- The air duct (6).

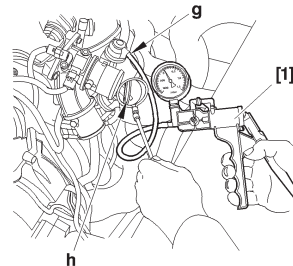
Connect the tool [1] on the warm air butterfly control diaphragm at «e».  
Apply a vacuum of  $0,7 \pm 0,2$ , the warm air butterfly «f» should be fully open.

## Checking the cold air closing.

Connect the tool [1] on the cold air butterfly control diaphragm at «g».  
Apply a vacuum of  $0,65 \pm 0,2$ , the cold air butterfly «h» should be fully closed.

## Refit:

- The air duct (4).
- The air duct (5).
- The air duct (6).



B1BP345C

## CHECKS: TURBO PRESSURE

Engine: RHR

## Tools.

[1] Pressure gauge for checking the turbo pressure	: 4073-T	Toolkit 4073-T
[2] Pressure take-off extension	: 8607-T.A	
[3] Pressure take-off union and hose	: 8607-T.B	
[4] Sleeve for checking the turbo pressure	: 4185-T	
[5] Adaptor sleeve	: 4219-T	

**IMPERATIVE:** Respect the safety and cleanliness specific to high pressure diesel injection engines.

**Preliminary operation.**

Slacken the clip (1).

Uncouple the air duct (2).

Connect the tool [1] on tool [2] and the tool [3] on tool [2].

**Positioning on the vehicle.**

Insert the tools [4] and [5] between the air duct (2) and the turbo air cooler outlet at «a».

Connect the tool [3] on tool [4].

Position the tool [1] inside the vehicle.

Start the engine.

Accelerate to **4000 rpm**.

The value should be

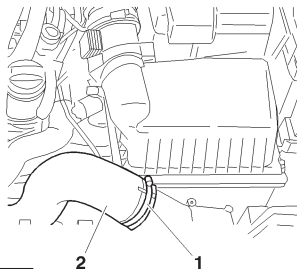
:  $1 \pm 0,2$ .

**Return the vehicle to conformity.**

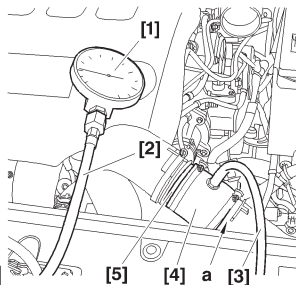
Remove tools [1], [2], [3], [4] and [5].

Recouple the air duct (2) on the turbo air cooler.

Tighten the clip (1).

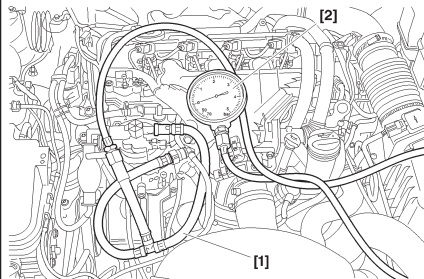


B1BP356C



B1HP1ZX C

## CHECKS: LOW PRESSURE FUEL SUPPLY CIRCUIT



B1BP33RD

Engine: RHR

## Tools.

[1] Ø 10 mm low pressure connector : 4215-T  
 [2] Pressure gauge for testing boost pressure : 4073-T.A      Toolkit 4073-T

**IMPERATIVE:** Respect the safety and cleanliness specific to high pressure diesel injection engines.

Link tools [1] and [2] in series between the fuel high pressure pump and the fuel filter.

**ESSENTIAL:** Check that the tool [2] is clean.

**Normal vacuum values.**

Engine driven by the starter motor :  $10 \pm 0,5$  cmHg.  
 Engine running under full load :  $20 \pm 10$  cmHg.

**Abnormal vacuum values.**

Supply circuit obstructed (*full tank strainer, piping, fuel filter*) :  $60 \pm 20$  cmHg.

SPECIFICATIONS OF THE DIESEL SYSTEM INJECTION PUMP								
BOSCH DIESEL SYSTEM equipment								
Engines				Injection system	ECU	High pressure pump	Injectors	
DV	6	ATED4	9HX	BOSCH	BOSCH EDC 16C34 2.10	BOSCH CP1H	DV63S	
		TED4	9HY		BOSCH S71		DV6CS	
			9HZ		BOSCH S74			
					BOSCH S71			
					BOSCH S74			
					BOSCH S80			
					BOSCH EDC 16C34 2.10			
SIEMENS DIESEL SYSTEM equipment								
DW	10	BTED4	RHR	SIEMENS	SIEMENS 5WS40029	DW A5C OXMH682B	DW A5C	

SPARKING PLUGS							
Vehicles - Models		Engine type	BOSCH	CHAMPION	SAGEM	Electrode gap setting (mm)	Tightening torque (m.daN)
C4	1.4i 16V	KFU	VR8SE			0.9 ± 0.05	2.25 ± 0.2
	1.6i 16V	NFU					3
	2.0i 16V	RFN			RFN52HZ3A		2.7 ± 0.2
	2.0i	RFJ		REC9MCLX			
	2.0i 16V	RFK	FR7ME				

## SPEEDOMETER

An E.E.C. decree of **25 June 1976**, regulates the speed displayed by the speedometer in relation to the actual speed travelled.

### This decree stipulates:

- The speed indicated by a speedometer must never be lower than the actual vehicle speed.
- Between the speed displayed «SD» and the speed travelled «ST», there must always be the following relationship:

$$ST < SD < 1.10 ST + 4 \text{ Kph}$$

**Example:** For an actual speed of **100 Kph** the speed displayed by the speedometer may be between **100** and **114 Kph**.

The speed indicated by the speedometer may be influenced by:

- The speedometer.
- The tyres fitted to the vehicle.
- The final drive ratio.
- The speedometer drive ratio.

Any of these components can be checked without removing them from the vehicle (*see information note N° 78-85 TT of 19 October 1978*).

**NOTE:** Before replacing the speedometer, check the conformity of the following points:

- The tyres fitted to the vehicle.
- The gearbox final drive ratio.
- The speedometer drive ratio.

## CLUTCH SPECIFICATIONS

Petrol

	1.4i 16V	1.6i 16V		2.0i 16V	2.0i	2.0i 16V
Engine type	KFU	NFU		RFN	RFJ	RFK
Gearbox type	MA5/L	MA5/N	AL4	BE4/5N	AL4	BE4R/5S
Supplier	SACHS	VALEO		VALEO		VALEO
Mechanism / Type	200 MF 3850	200 CPX 3850		230 DNG 5100		230 DNG 5100
Clutch disc	SAE 24/48-8Z	11 RX		11 R 14X		11 R 14X
Identification of the springs	2 (Orange)	2 (Black)		4 (Blue)		4 (Blue)
Number of splines	18					
Ø of lining. Ext/Int	200/134	200/137		228.6/155		228.6/155
Quality of lining	F810 DS	810 DS		810 DS		810 DS

## CLUTCH SPECIFICATIONS

Diesel

1.6 HDi 16V

2.0 HDi 16V

Engine type

9HX

9HY\*

9HZ\*

RHR\*\*

Gearbox type

BE4/5L

ML6C

Supplier

LUK

Mechanism / Type

235 P 4800

235 P 7400

Clutch disc

Identification  
of the springs

4  
(White)

Number of splines

18

Ø of lining. Ext/Int

234/165

235/150

Quality of lining

810 DS

**NOTE: (\*) DVAR:** Equipped with a Double Damping Flywheel with springs in the radial position in relation to the axis of the crankshaft.

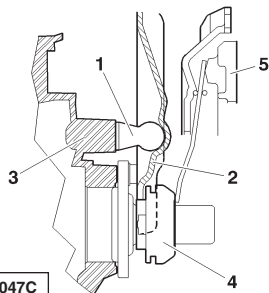
**NOTE: (\*\*) DVA:** Equipped with a Double Damping Flywheel with springs arranged concentrically.

CLUTCH  
GEARBOX  
DRIVESHAFTS

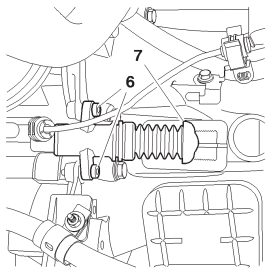


## CLUTCH SPECIFICATIONS

Engines: KFU - NFU - RFN - RFJ - RFK - 9HX - 9HY - 9HZ - RHR



B2BP047C



B2CP3FAC

**NOTE:** All the clutches are «push» type with hydraulic control.

**NOTE:** The **DV6TED4** and **DW10BTED4** engines are equipped with a double damping flywheel (DVA).

**NOTE:** All the clutches are «push» type with hydraulic control.

### Description.

The declutch control has a declutch fork with a ball-joint on the axis.

(1) The ball-joint is screwed into the clutch casing

(2) Declutch fork

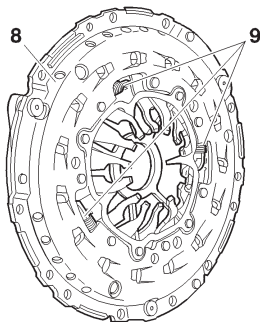
(3) Clutch casing

(4) Bearing

(5) Clutch plate

The clutch control slave cylinder (7) is fixed by two screws (6) onto the exterior of the clutch casing.

## CLUTCH SPECIFICATIONS



### Features.

The **LUK** clutch discs have no damper hubs. The filtering of the noise generated by the gearbox is provided by the double damping flywheel (**DVA**) (\*) and no longer by the clutch disc hub.

The **LUK** clutch mechanism has an automatic compensation device, requiring special tooling when being refitted.

- (8) Mechanism with automatic compensation
- (9) Compensation springs

(\*) **DVA** = Double damping flywheel.

B2BP05YC

## GEARBOX AND TYRE SPECIFICATIONS

GEARBOX AND TYRE SPECIFICATIONS						
		Petrol				
		1.4i 16V	1.6i 16V		2.0i 16V	
				Automatic		
Trim level		Level 1 - Level 2	Level 1 - Level 4	Level 2 - Level 4	Level 2 - Level 4	
Engine type		KFU	NFU		RFN	
Tyres Rolling circumference		195/65 R15 1,934 m	195/65 R15 1,934 m (*) 205/55 R16 1,924 m 205/50 R17 1,941 m	205/55 R16 1,924 m 205/50 R17 1,941 m	205/55 R16 1,924 m 205/50 R17 1,941 m	
Gearbox type		MA/5L	MA/5N	BE4/5	AL4	BE4/5N BE4R/5S
Gearbox ident. plate		20 CP 42	20 CP 43	20 DM 81 (*)	20 TS 12	20 DM 71 20 DM 74 (*)
Reduction box torque		13x59	13x61	15x74	20x73	19x77 17x81
Speedometer ratio		21x18	None	21x18		22x18
Descent ratio	Auto.			52/67		

(\*) = Brio version: Export outside Europe.

## GEARBOX AND TYRE SPECIFICATIONS

Petrol			
		2.0i	2.0i 16V
		Automatic	
Trim level	Level 3 – Level 4		Level 4
Engine type	RFJ		RFK
Tyres	205/50 R17		205/50 R17
Rolling circumference	1,941 m		1,941 m
Gearbox type	AL4		BE4/5T
Gearbox ident. plate	20 TS 11		20 DM 68
Reduction box torque	21x73		17x73
Speedometer ratio			22x18
Descent ratio	Auto.	52/67	

CLUTCH  
GEARBOX  
DRIVESHAFTS

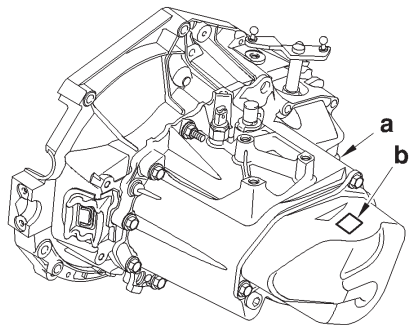
## GEARBOX AND TYRE SPECIFICATIONS

	Diesel			
	1.6 HDi 16V			2.0 HDi 16V
Trim level	Level 1 - Level 3		Level 2 - Level 4	
Engine type	9HX		9HY	9HZ
Tyres	195/65 R15		205/55 R16	
Rolling circumference	1,934 m*		1,924 m	
	205/55 R16		205/50 R17	
	1,924 m		1,941 m	
Gearbox type	BE4/5L			ML6C
Gearbox ident. plate	20 DM 75	20 DM 76 (*)	20 DM 69	
Reduction box torque	19x72	17x71	19x72	
Speedometer ratio	22x18			

(\*) = Brio version: Export outside Europe.

## MA/5 GEARBOX

Engines: KFU - NFU



«a» Location for engraving of serial and gearbox nos

«b» Identification label

### Features.

This gearbox has no adjustment.

Gearbox equipment:

- Reverse gear braking device (*5th gear synchroniser*).
- Device for prohibiting a change from 5th gear into reverse gear.
- Hydraulic clutch control.

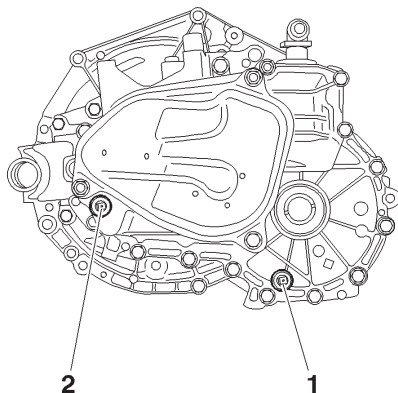
The clutch control has a ball-joint mounted declutch fork.

B2CP3SQC

CLUTCH  
GEARBOX  
DRIVESHAFTS

**MA/5 GEARBOX**

Engines: KFU - NFU



B2CP3HWC

**Draining - Filling - Level.****(1) Gearbox drain plug****Oil quality.**

Refer to the manufacturer's recommendations.

**Oil quantity.**After draining: **2 ± 0,15 litres.****Checking the oil level.**

No oil level checks \*.

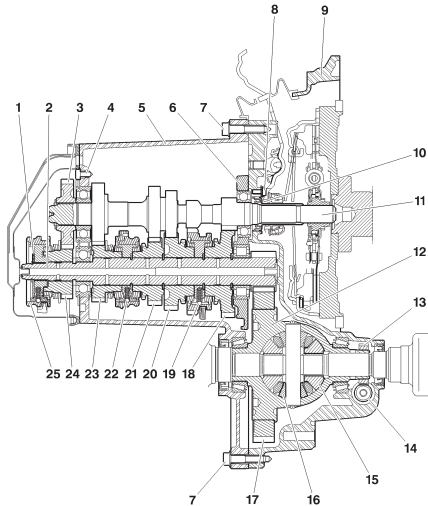
**Lubrication interval.**

Lubrication «for life».

**NOTE:** (\*) Do a visual check of the sealing at each engine oil change interval.

## MA/5 GEARBOX

Engines: KFU - NFU



- (1) Retaining clip
- (2) Secondary shaft
- (3) Drive pinion (*5th gear*)
- (4) Bearing retaining clip screw
- (5) Gearbox casing
- (6) Intermediate plate
- (7) Gearbox casing fixing screw
- (8) Clutch bearing guide screw
- (9) Clutch housing
- (10) Bearing guide
- (11) Primary shaft
- (12) Differential housing

- (13) Speedometer screw
- (14) Counter drive
- (15) Planet pinions
- (16) Satellite pinions
- (17) Differential gearwheel
- (18) Driven pinion (*1st gear*)
- (19) 1st/2nd gear synchroniser and reverse gear driven pinion
- (20) Driven pinion (*2nd gear*)
- (21) Driven pinion (*3rd gear*)
- (22) 3rd/4th gear synchroniser
- (23) Driven pinion (*4th gear*)
- (24) Driven pinion (*5th gear*)
- (25) 5th gear synchroniser

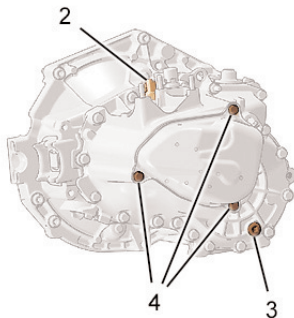
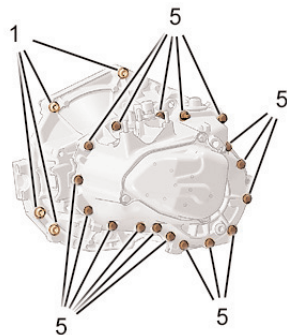
B2CP3SRP

CLUTCH  
GEARBOX  
DRIVESHAFTS



**TIGHTENING TORQUES: MA/5 GEARBOX**

Engines: KFU - NFU

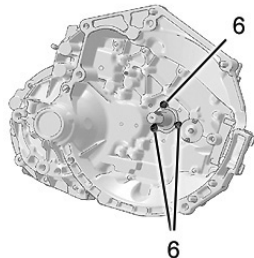
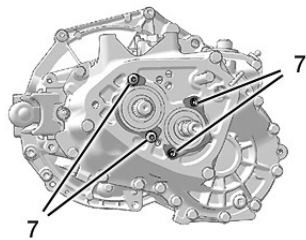
**Tightening torques (m.daN).**

- |  |                 |
|--|-----------------|
| (1) Gearbox fixings on engine                    | : $4,5 \pm 0,5$ |
| (2) Reverse gear switch                          | : $2,5 \pm 0,2$ |
| (3) Drain plug                                   | : $3,3 \pm 0,3$ |
| (4) 5th gear housing fixing                      | : $2,2 \pm 0,2$ |
| (5) Fixing of gearbox housing and clutch housing | : $1,9 \pm 0,2$ |

B2CP3ZHD

## TIGHTENING TORQUES: MA/5 GEARBOX

Engines: KFU - NFU



### Tightening torques (m.daN).

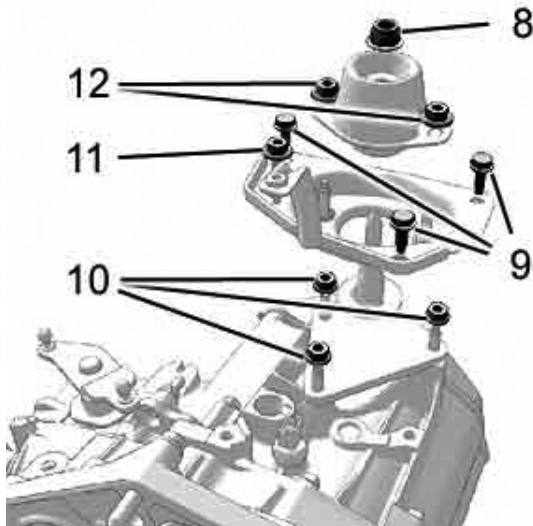
(6) Clutch bearing guide screw	: $1 \pm 0,1$
(7) Bearing retaining clip screw	: $1,8 \pm 0,2$
Intermediate plate fixing	: $5 \pm 0,5$
Hydraulic clutch slave cylinder fixing	: $3 \pm 0,3$

B2CP3ZJD

CLUTCH  
GEARBOX  
DRIVESHAFTS

**TIGHTENING TORQUES: MA/5 GEARBOX**

Engines: KFU - NFU

**Tightening torques (m.daN).**

(8) Gearbox support shaft nut	: $6,5 \pm 0,6$
(9) Screws fixing gearbox support on body	: $1,9 \pm 0,1$
(10) Gearbox support plate nut	: $2,5 \pm 0,2$
(11) Nut fixing gearbox support on body	: $1,9 \pm 0,1$
(12) Nut securing rubber bush	: $3 \pm 0,3$

B2CP3ZKC

## MA/5 GEARBOX CONTROLS

Engines: KFU - NFU

### Gear controls

The gear selection and engagement cables have no adjustment.

**NOTE:** The **two cables** cannot be separated.

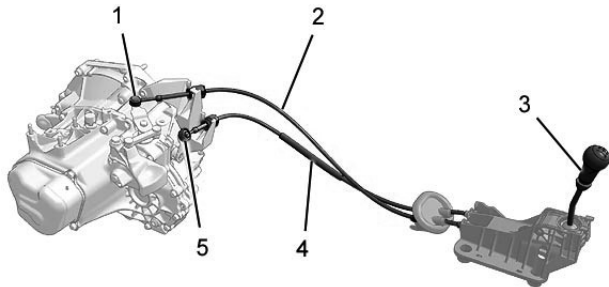
(1) Gear engagement ball-joint : Ø 10 mm

(2) Gear engagement control cable

(3) Gear control lever

(4) Gear selection control cable

(5) Gear selection ball-joint : Ø 10 mm

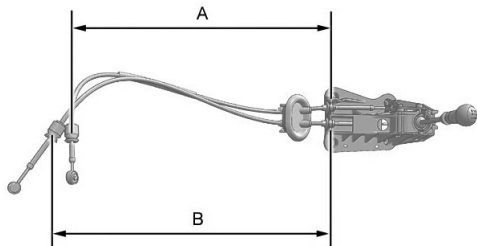


B2CP3ZCD

CLUTCH  
GEARBOX  
DRIVESHAFTS

## MA/5 GEARBOX CONTROLS

Engines: KFU - NFU



B2CP3ZDD

## Gear selection and engagement control cables

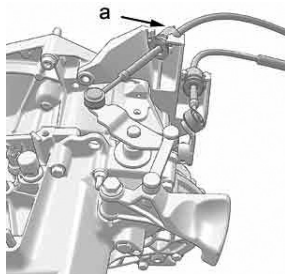
Gear engagement control cable

Length A (mm)

 $791,2 \pm 2$ 

Gear selection control cable

Length B (mm)

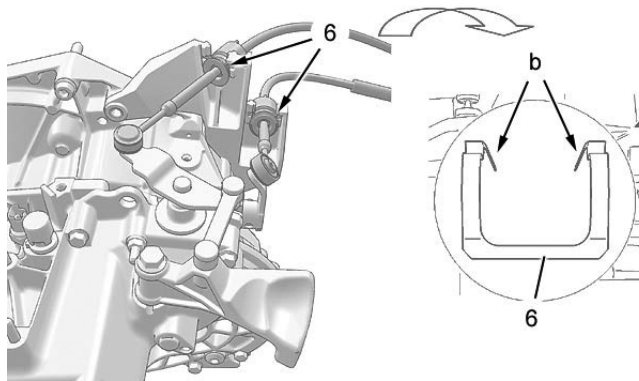
 $791,2 \pm 2$ 

B2CP3ZEC

**NOTE:** The gear engagement cable has a **black colour** identification on the sleeve stop at «a».

## MA/5 GEARBOX CONTROLS

Engines: KFU - NFU



### Unlocking a sleeve stop.

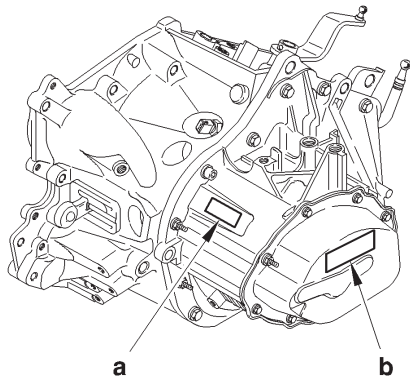
Press on the tabs of the clip **(6)** at «**b**», using a small flat screwdriver.

Disengage the sleeve stops from their supports by pulling upwards.

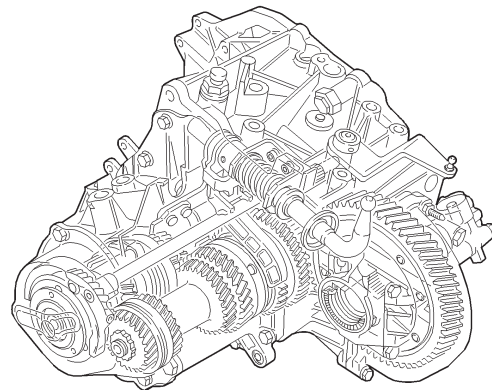
B2CP3ZFD

## BE4/5 GEARBOX

Engines: RFN - RFK - 9HX - 9HY - 9HZ



B2CP3BNC



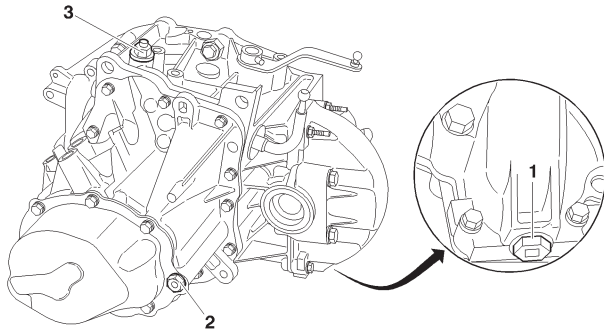
B2CP3BPD

- (a) Engraving zone (*serial nos.*)  
(b) Location of the identification label

## BE4/5 GEARBOX

Engines: RFN - RFK - 9HX - 9HY - 9HZ

### Draining - Filling - Level.



(1) Drain plug

(2) Filling and level plug

(3) Air vent

**NOTE:** The air vent hole can be used for filling.

#### **Oil quality.**

Refer to the manufacturer's recommendations.

#### **Oil quantity.**

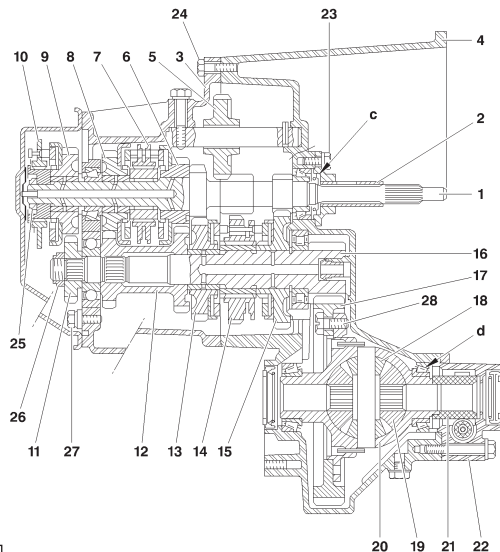
Gearbox empty: **1,9 Litres.**

After draining: **2 Litres.**



## BE4/5 GEARBOX

Engines: RFN - RFK - 9HX - 9HY - 9HZ

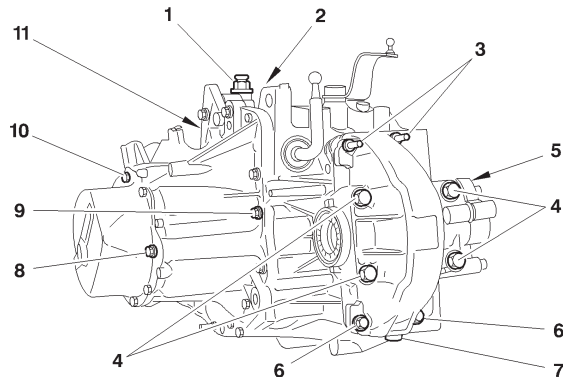


- (1) Primary shaft
- (2) Clutch bearing guide
- (3) Gearbox casing
- (4) Clutch housing
- (5) Reverse idle
- (6) Drive gear (*3rd gear*)
- (7) 3rd/4th gear synchroniser
- (8) Drive gear (*4th gear*)
- (9) Drive gear (*5th gear*)
- (10) 5th gear synchroniser
- (11) Driven gear (*5th gear*)
- (12) Driven gear (*3rd/4th gear*)
- (13) Driven gear (*2nd gear*)
- (14) 1st/2nd gear synchroniser
- (15) Driven gear (*1st gear*)
- (16) Secondary shaft
- (17) Differential gear
- (18) Satellite gears
- (19) Planet gears
- (20) Differential housing
- (21) Speedometer drive
- (22) Extension
- «c» Adjusting shims: **0.70 to 1.95 mm**
- «d» Adjusting shims: **1.40 to 1.60 mm**

B2CP3VVP

## TIGHTENING TORQUES: BE4/5 GEARBOX

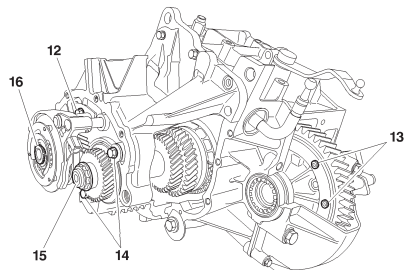
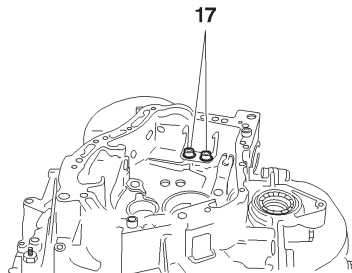
Engines: RFN - RFK - 9HX - 9HY - 9HZ



<u>Tightening torques (m.daN).</u>	
(1) Air vent hole	: $1,5 \pm 0,2$
(2) Reverse gear rocker switch shaft fixing nut	: $4,5 \pm 0,2$
(3) Differential housing fixing nut	: $1,5 \pm 0,2$
(4) Screw fixing ( $\varnothing$ M10) differential housing	: $5 \pm 0,5$
(5) Speedometer drive support	: $1,5 \pm 0,2$
(6) Screw fixing ( $\varnothing$ M7) differential housing	: $1,5 \pm 0,2$
(7) Drain plug	: $3,5 \pm 0,2$
(8) Level plug	: $2,2 \pm 0,2$
(9) Screw fixing gearbox housing/clutch housing	: $1,3 \pm 0,2$
(10) Screw fixing 5th gear housing	: $1,5 \pm 0,2$
(11) Reverse gear switch	: $2,5 \pm 0,2$

B2CP3ZXD

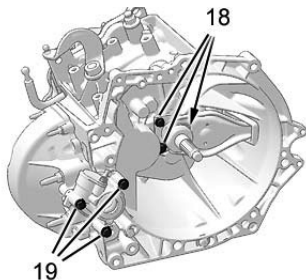
CLUTCH  
GEARBOX  
DRIVESHAFTS

**TIGHTENING TORQUES: BE4/5 GEARBOX****Engines: RFN - RFK - 9HX - 9HY - 9HZ****B2CP3ZYD****B2CP3ZZC****Tightening torques (m.daN).**

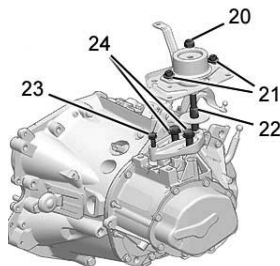
<b>(12)</b> Fork shaft stop screw	<b>: 1,5 ± 0,2</b>
<b>(13)</b> Differential gearwheel fixing screw	<b>: 6 ± 0,5</b>
<b>(14)</b> Bearing stop screw	<b>: 1,5 ± 0,2</b>
<b>(15)</b> Secondary shaft nut	<b>: 6,5 ± 0,5</b>
<b>(16)</b> Primary shaft nut	<b>: 7,3 ± 0,5</b>
<b>(17)</b> Gear control support fixing screw	<b>: 1,5 ± 0,2</b>

## TIGHTENING TORQUES: BE4/5 GEARBOX

Engines: RFN - RFK - 9HX - 9HY - 9HZ



B2CP400C



B2CP401C

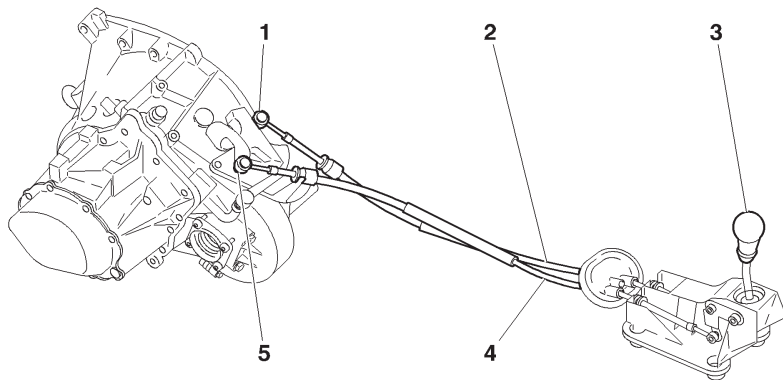
### Tightening torques (m.daN).

(18) Stop guide screw	: 1,25 ± 0,2
(19) Speedometer fixing screw	: 1,5 ± 0,2
(20) Gearbox support shaft nut	: 6,5 ± 0,6
(21) Nuts fixing rubber support	: 3 ± 0,2
(22) Gearbox rubber support shaft	: 5 ± 0,5
(23) Screw <b>M10</b> fixing the engine/gearbox housing support	: 6 ± 0,5
(24) Screws <b>M10</b> fixing the engine/gearbox housing support	: 3 ± 0,3

CLUTCH  
GEARBOX  
DRIVESHAFTS

**BE4/5 GEARBOX CONTROLS**

Engines: NFU - RFN - RFK - 9HX - 9HY - 9HZ

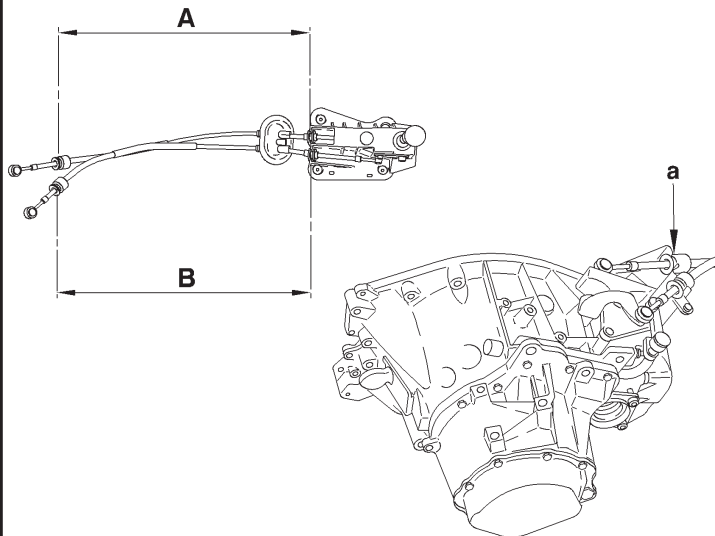
**Gear controls.****(1) Gear engagement ball-joint : Ø 10 mm****(2) Gear engagement control cable****(3) Gear control lever****(4) Gear selection control cable****(5) Gear selection ball-joint : Ø 10 mm**

The gear selection and engagement cables have no adjustment.

B2CP3ZOD

## BE4/5 GEARBOX CONTROLS

Engines: NFU - RFN - RFK - 9HX - 9HY - 9HZ



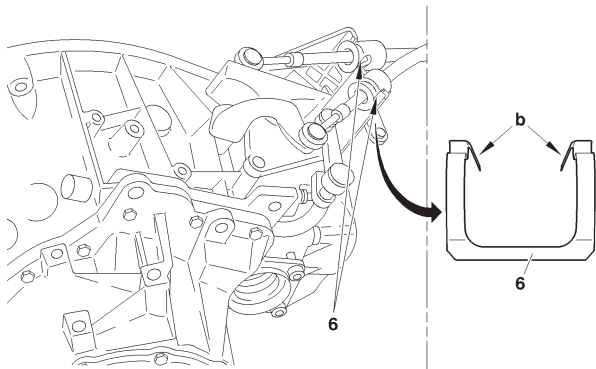
	Length A (mm)
Gear engagement control cable	643 ± 2
	Length B (mm)
Gear selection control cable	670 ± 2

**NOTE:** The gear engagement cable has a **black colour** identification on the sleeve stop at «a».

B2CP3Z1C

B2CP3Z2C

CLUTCH  
GEARBOX  
DRIVESHAFTS

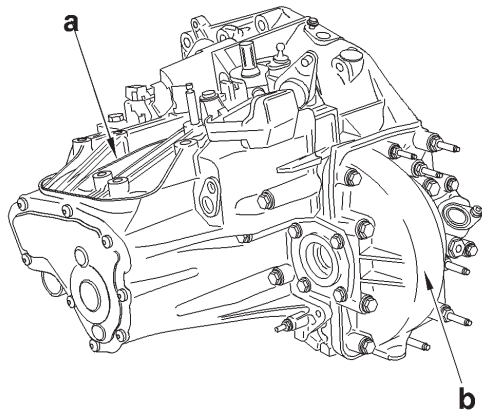
**BE4/5 GEARBOX CONTROLS****Engines: NFU - RFN - RFK - 9HX - 9HY - 9HZ****B2CP3Z3D****Features.**

Unlocking a sleeve stop:

- Press on the tabs of the clip **(6)** at «**b**», using a flat screwdriver.
- Disengage the sleeve stops from their supports by pulling upwards.

## ML6 GEARBOX

Engine: RHR



B2CP3SAC

- (a) Location of the identification label  
(b) Engraving zone for serial nos

### Features.

#### Differential.

- The differential has **4 satellites**.
- The adjustment of the meshing clearance between the planet and satellite pinions is by means of friction washers of different thicknesses: **1,66 mm - 1,73 mm - 1,80 mm - 1,87 mm.**

#### Primary shaft.

- The adjustment of the clearance between the outer face of the 6th gear bearing and the upper face of the gearbox casing is by means of adjustment shims of different thicknesses: **0,80 mm - 0,85 mm - 0,90 mm - 1,05 mm - 1,10 mm - 1,15 mm - 1,20 mm - 1,25 mm - 1,30 mm - 1,35 mm - 1,40 mm - 1,45 mm - 1,50 mm.**

#### Checking conditions.

- Apply a load of  **$5 \pm 0,2$  m.daN** on the bearing face.
- Rotate the primary shaft at least **10 times**.

#### Secondary shaft.

- The secondary has no adjustment.

#### Repair:

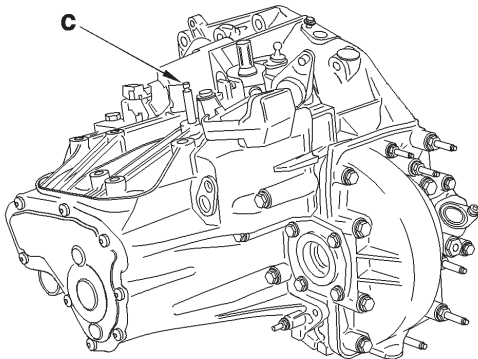
- It is necessary to replace the **6th gear** casing each time it is removed (*deformation on dismantling*).

**IMPERATIVE:** Remove the declutch fork shaft before uncoupling the gearbox from a DW type engine, using tool (-).0332-T («**PULL**» type clutch).



## ML6 GEARBOX

Engine: RHR



### Draining - Filling - Level.

«C» Filling the gearbox with oil through the air vent hole

#### **Oil quantity (after draining).**

Minimum: **2,4 litres.**

Maximum: **2,7 litres.**

#### **Oil quantity (after a repair in the gearbox).**

Minimum: **2,6 litres.**

Maximum: **2,9 litres.**

#### **Oil quality.**

**ESSO 75W80 EZL 848 or TOTAL 75W80 H6959.**

#### **Checking the oil level.**

No oil level checks.\*

#### **Lubrication interval.**

Lubrication «for life».

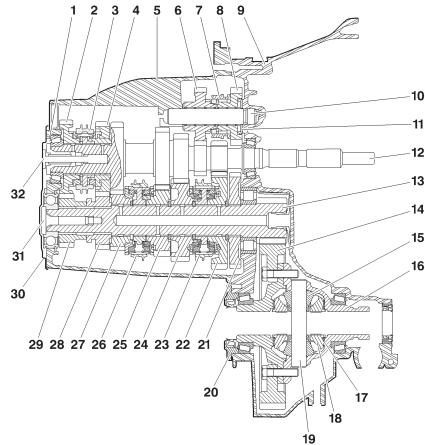
**NOTE: (\*)** Do a visual check of the sealing at each engine oil change interval.

**IMPERATIVE:** It is necessary to drain the gearbox and to put back the exact quantity of oil, after an external leak and following a repair.

B2CP3SFC

## ML6 GEARBOX

Engine: RHR



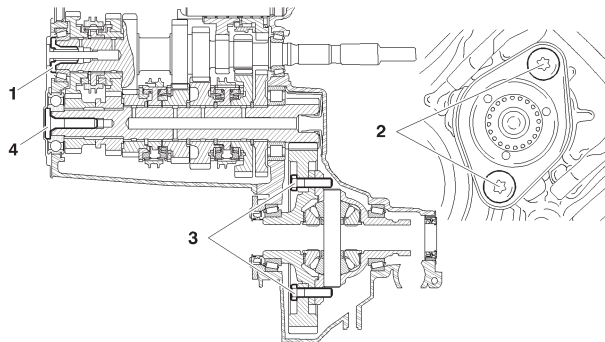
- |   |  |
|---|--|
| (1) Shim for adjusting the play of the primary<br>shat bearings | (16) Differential housing              |
| (2) Drive pinion ( <i>6th gear</i> )                            | (17) Planet adjustment shim            |
| (3) 5th/6th gear synchronisation                                | (18) Planet pinions                    |
| (4) Drive pinion ( <i>5th gear</i> )                            | (19) Satellite shaft                   |
| (5) Gearbox housing   | (20) Differential bearing stop plate   |
| (6) Reverse gear intermediate pinion                            | (21) Reverse gear driven pinion        |
| (7) Reverse gear synchroniser                                   | (22) Driven pinion ( <i>1st gear</i> ) |
| (8) Reverse gear idling pinion                                  | (23) 1st/2nd gear synchroniser         |
| (9) Clutch housing  | (24) Driven pinion ( <i>2nd gear</i> ) |
| (10) Reverse gear shaft   | (25) Driven pinion ( <i>3rd gear</i> ) |
| (11) Reverse gear needle bearing                                | (26) 3rd/4th gear synchroniser         |
| (12) Primary shaft  | (27) Driven pinion ( <i>4th gear</i> ) |
| (13) Secondary shaft  | (28) Driven pinion ( <i>5th gear</i> ) |
| (14) Differential gearwheel                                     | (29) Driven pinion ( <i>6th gear</i> ) |
| (15) Satellite pinions  | (30) 6th gear housing                  |
|   | (31) Secondary shaft screw             |
|   | (32) Primary shaft screw               |

B2CP3YZP

CLUTCH  
GEARBOX  
DRIVESHAFTS

**TIGHTENING TORQUES: ML6 GEARBOX**

Engine: RHR

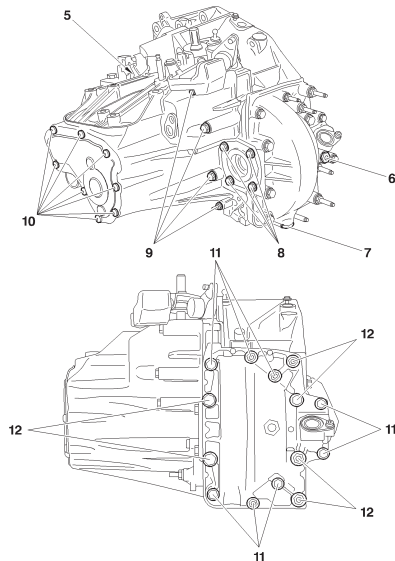
**Tightening torques (m.daN).**

- |                                  |                 |
|----------------------------------|-----------------|
| (1) Primary shaft screw          | : $10 \pm 1$    |
| (2) Bearing guide screw          | : $2 \pm 0,2$   |
| (3) Differential gearwheel screw | : $7,7 \pm 0,3$ |
| (4) Secondary shaft screw        | : $13 \pm 1,3$  |

B2CP3ZLD

## TIGHTENING TORQUES: ML6 GEARBOX

Engine: RHR



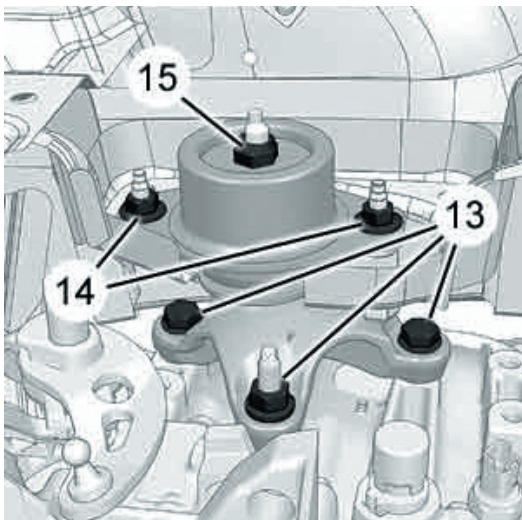
### Tightening torques (m.daN).

(5) Reverse gear switch		: 2,5 ± 0,5
(6) Level plug		: 3 ± 0,2
(7) Drain plug		: 3 ± 0,3
(8) Differential bearing stop plate screw		: 3 ± 0,3
(9) Screw fixing gearbox housing/clutch housing		: 3 ± 0,3
(10) 6th gear housing fixing screw		: 2 ± 0,2
(11) Differential housing fixing	(screws M8)	: 1,8 ± 0,3
(12) Differential housing fixing	(screws M10)	: 4 ± 0,8

B2CP3ZMP

**TIGHTENING TORQUES: ML6 GEARBOX**

Engine: RHR

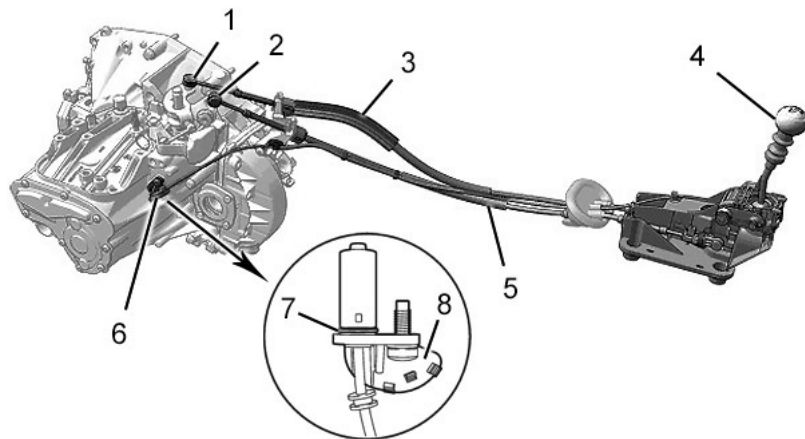
**Tightening torques (m.daN).**

- |   |                 |
|---|-----------------|
| (13) Screws/nuts fixing the gearbox support | : $4,5 \pm 0,4$ |
| (14) Screw fixing the rubber bush           | : $3 \pm 0,3$   |
| (15) Nut fixing the gearbox casing          | : $6,5 \pm 0,6$ |

B2CP3ZNC

## ML6 GEARBOX CONTROLS

Engine: RHR



### Gear controls.

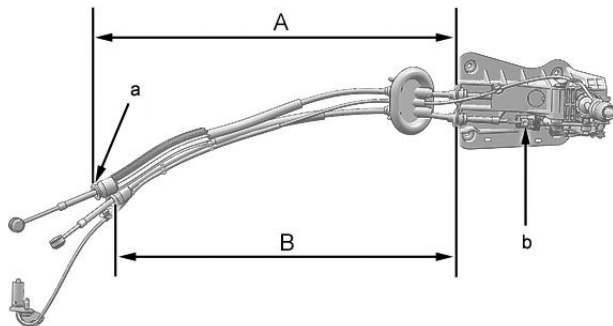
- (1) Gear engagement ball-joint : Ø 10 mm
- (2) Gear selection ball-joint : Ø 10 mm
- (3) Gear engagement control cable
- (4) Gear control lever
- (5) Gear selection control cable
- (6) Reverse gear unlocking cable
- (7) O-ring seal
- (8) Reverse gear unlocking device

B2CP3ZPD

## ML6 GEARBOX CONTROLS

Engine: RHR

## Adjustment of the gear selection control cable



B2CP3ZQD

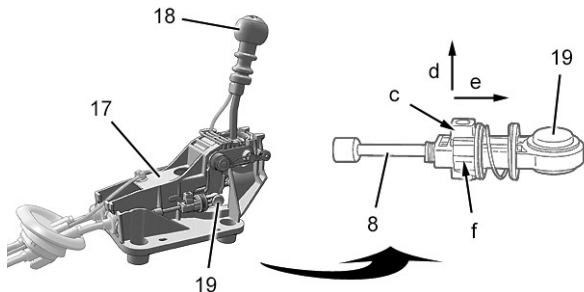
Adjustment NO	
Length A (mm)	
Gear engagement control cable	723 ± 2
Adjustment YES at «b»	
Length B (mm)	
Gear selection control cable	674 ± 2

**NOTE:** In order to differentiate the two gear control cables when they have been removed, the gear engagement cable has a **black colour** identification on the sleeve stop at «a».

## ML/6 GEARBOX CONTROLS

Engine: RHR

### Adjustment of the gear selection control cable



Perform the following operations simultaneously:

- Move the cylinder «f» in the direction of the arrow «e».
- Pull the locking key «c» in the direction of the arrow «d».

Check that the gear lever (18) is in the mid position on the control housing (17).

Couple the ball-joint (19).

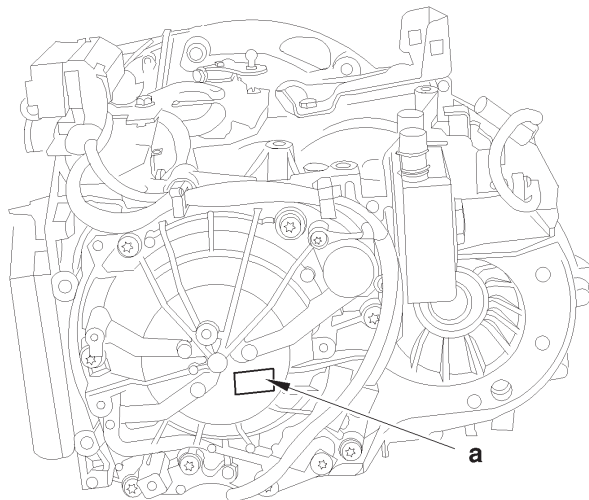
Press on the locking key «c».

**IMPERATIVE: Check that all the gears engage.**



## AL4 AUTOMATIC GEARBOX

Engines: NFU - RFJ



B2CP3ECD

**WARNING:** This gearbox uses a special **CITROEN** semi-synthetic oil, which cannot be mixed with any other oil. The gearbox is lubricated for life.

Total oil capacity : **5,85 Litres.**

Capacity after draining : **3 Litres.**

«a» Component reference

**NFU = 20 TS 12**

**RFJ = 20 TS 11**

## RECOMMENDATIONS - PRECAUTIONS (AL4 AUTOMATIC GEARBOX)

Engines: NFU - RFJ

### PRECAUTIONS TO BE TAKEN

#### Towing.

The front of the vehicle must be raised in order to be towed.  
If the front of the vehicle cannot be raised.

**IMPERATIVE: Put gear lever in position «N».**

- Do not add any oil.
- Do not exceed 30 mph over a distance of 30 miles of maximum.

#### Driving.

Never drive with the ignition switched off.  
Never push the vehicle to try to start it (*impossible with an automatic gearbox*).

#### Lubrication.

The automatic gearbox is only lubricated when the engine is running.

#### Removing - Refitting (automatic gearbox).

**WARNING:** Never place the gearbox on its lower casing  
(*risk of deformation of the tray and damage to the hydraulic block*).

- Do not use the connectors as handles to lift, turn, hold or push the gearbox.

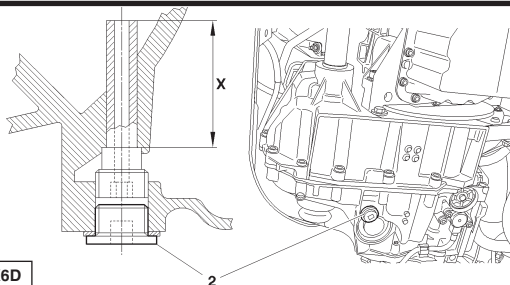
#### IMPERATIVE:

- Set the converter retaining peg when the gearbox is being removed.
- Place the centring peg to line up the gearbox on the engine  
(*remove the converter retaining peg just prior to this lining up*).

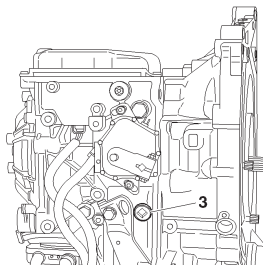
**WARNING:** In emergency mode, there is a noticeable snatching when changing «P» → «R» or «N» → «R».

## RECOMMENDATIONS - PRECAUTIONS (AL4 AUTOMATIC GEARBOX)

Engines: NFU - RFJ



B2CP3X6D



B2CP3X5C

Draining - Filling.**Tooling recommended.**

[1] Filling cylinder

: (-).0341

**Draining.****IMPERATIVE:** The gearbox should be drained when the oil is warm (*at least 60°C*), to eliminate the impurities in suspension in the oil.**NOTE:** Draining is partial, the converter cannot be completely emptied.

Remove:

- The level plug (2).
- The oil draining and overflow plug (1).

**NOTE:** Approx. **3 litres** of oil should flow out.**Filling.**

- Refit the drain plug (1), tighten to **0,9 ± 0,2 m.daN**.
- Remove the oil filler cap (2).
- Use tool [1].

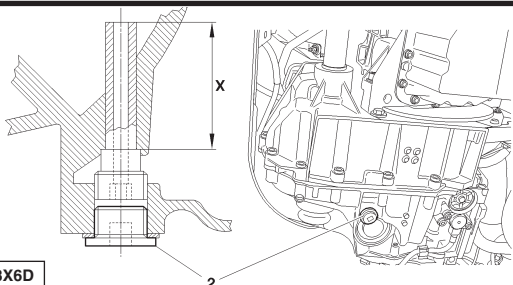
Oil capacity:

- Oil capacity for dry gearbox: **5,85 litres**.
- Oil remaining after draining: **3 litres (approx.)**.
- Quantity of oil to be put back in: **3 litres (approx.)**.
- Refit the oil filler cap (2) (*equipped with a new seal*), tighten to **2,4 m.daN**.

Initialise the oil wear counter (*follow the diagnostic tool procedure*).

## RECOMMENDATIONS - PRECAUTIONS (AL4 AUTOMATIC GEARBOX)

Engines: NFU - RFJ



B2CP3X6D

**NOTE:** Dimension **X = 48 mm**.

An excessive level of oil can lead to the following consequences:

- Oil heating up abnormally.
- Oil leaks.

A level that is too low will result in the destruction of the gearbox.

### Checking the oil level (*prior conditions*).

- Vehicle in horizontal position.
- Check gearbox is not in back-up mode.
- Remove the oil filler cap **(3)**.
- Add **0,5 litres** extra oil into the gearbox.
- Foot on the brake, change through all the gears.
- Selection lever in position "**P**".
- Engine running, at idle.
- Oil temperature: **60°C (+8°C ; -2°C)**, measured by means of the diagnostic tool.
- Remove the oil level plug **(2)**.

### Thread of oil then "drip-drip".

Refit the plug **(3)** (*equipped with a new seal*). Tighten to **2,4 m.daN**.

### "Drip-drip" or nothing.

Refit the oil level plug **(2)**.

- Stop the engine.
- Add **0,5 litres** extra oil into the gearbox.
- Repeat the oil level procedure.

**NOTE:** The level is correct at the moment the thread of oil becomes "**drip-drip**".

- Refit the oil level plug **(2)** (*equipped with a new seal*), tighten to **3,3 ± 0,5 m.daN**.
- Refit the oil filler plug **(3)** (*equipped with a new seal*), tighten to **2,4 m.daN**.

**RECOMMENDATIONS - PRECAUTIONS (AL4 AUTOMATIC GEARBOX)**

Engines: NFU - RFJ

**PROCEDURE BEFORE A REPAIR**

**When the ECU detects a value that is incorrect or absent on one of its inputs or outputs:**

- It writes the fault into memory.
- For each type of associated context, it records the context of the earliest fault into memory.
- It launches a back-up mode strategy.

**There are two sort of back-up mode:**

- The ECU uses replacement values (*impact on comfort, gear changing quality, loss of functions*).
- Change to emergency mode (*only 3rd gear and reverse gear are available*).

**Reading of fault codes.**

Carry out a reading of the fault codes.

- Absence of fault codes.

Carry out a measuring of parameters.

Presence of faults confirmed:

- **YES:** Perform the necessary repairs.
- **NO:** Read the fault codes: **engine ECU**.  
Carry out a road test.

Having carried out an **ECU** initialisation procedure, for a certain time one may obtain gear changing quality that is more or less good (*adaptation of the ECU parameters to the gearbox*).

To improve the quality, it is necessary to perform a road test with frequent changing through the gears (*auto-adaptive laws*).

## RECOMMENDATIONS - PRECAUTIONS (AL4 AUTOMATIC GEARBOX)

Engines: NFU - RFJ

ECU: Initialisation

### Updating the gearbox ECU by downloading.

- Follow the procedure using the diagnostic tool.

The downloading operation enables the automatic gearbox to be updated, or adapted to an evolution of the engine ECU.

Before commencing the downloading, take the value of the oil usage counter present in the automatic gearbox ECU.

### After the downloading operation, carry out the following.

- A clearing of faults.
- An initialisation of the auto-adaptives.
- A writing of the value of the oil usage counter previously read.
- A road test.

**ESSENTIAL:** Every update of the automatic gearbox ECU should be accompanied by an update of the engine ECU.

### Updating the value of the oil usage counter.

#### Using PROXIA

Access to reading and recording of the oil counter is via the menu:  
«**Configuration (integrated circuit button)/Oil counter**».

Adjustment of the oil counter value is done in incremental steps of  
**2750 units**.

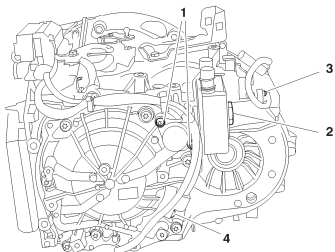
#### Using LEXIA

Access to reading and recording of the oil counter is via the menu:  
«**Oil counter**».

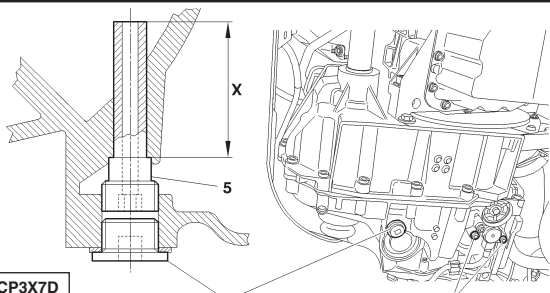
Adjustment of the oil counter value is done by entering directly the **5 figures** of the oil counter.

**TIGHTENING TORQUES: AUTOMATIQUE AL4**

Engines: NFU - RFJ



B2CP3EDD



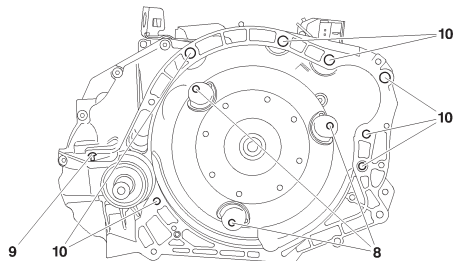
B2CP3X7D

**Tightening torques (m.daN).**

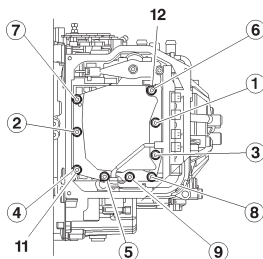
- |   |                 |
|---|-----------------|
| (1) Oil flow modulation electrovalve fixing in the exchanger (EPDE) | : $1 \pm 0,2$   |
| (2) Heat exchanger fixing   | : $5 \pm 1$     |
| (3) Output speed sensor fixing                                      | : $1 \pm 0,2$   |
| (4) Input speed sensor fixing                                       | : $1 \pm 0,2$   |
| (5) Oil overflow and drain plug fixing ( $X = 48 \text{ mm}$ )      | : $0,9 \pm 0,2$ |
| (6) Oil level plug  | : $3,3 \pm 0,5$ |
| (7) Oil pressure sensor fixing                                      | : $0,8 \pm 0,1$ |

## AL4 AUTOMATIC GEARBOX

Engines: NFU - RFJ



B2CP3EED



B2CP3X8C

### Tightening torques (m.daN).

**(8)** Fixing of converter on diaphragm

- Pre-tightening :  $1 \pm 0,1$

- Tightening :  $3 \pm 0,3$

**(9)** Plug fixing

:  $0,8 \pm 0,2$

**(10)** Gearbox fixing on engine

:  $5,2 \pm 1$

### **Hydraulic block fixing.**

Centre the hydraulic block, using screws **(11)** and **(12)**.

- Pre-tighten (no strict order) :  $0,9$

- Slacken : **All 7 screws**

- Tighten (respect the order indicated) :  $0,75$

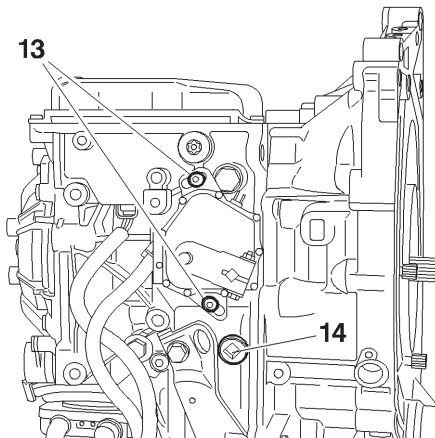
**NOTE:** The screw **(11)** is shouldered.

CLUTCH  
GEARBOX  
DRIVESHAFTS



## AL4 AUTOMATIC GEARBOX

Engines: NFU - RFJ



(13) Fixing of selector lever position switch

:  $1,5 \pm 0,2$

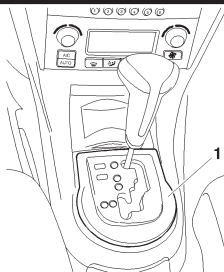
(14) Oil filler plug

:  $2,4 \pm 0,4$

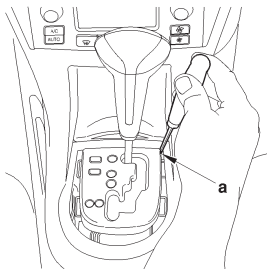
B2CP3EGC

## RECOMMANDATIONS - PRECAUTIONS ( AL4 AUTOMATIC GEARBOX )

Engines: NFU - RFJ



C5FP0NZC



C5FP0P0C

### SHIFT LOCK.

The «**shift lock**» is a system that locks the gear selection lever in position «**P**».

#### Unlocking the «**SHIFT LOCK**» (*normal operation*).

- Switch on the ignition.
- Press the brake pedal and keep it pressed.
- Move the gear selection lever out of position «**P**».

#### Unlocking the «**SHIFT LOCK**» (*with an operating fault*).

**NOTE:** It is impossible to unlock the «**shift lock**» with the «**Normal operation**» method.

The fault may originate from one of the following components:

#### «**Shift lock**».

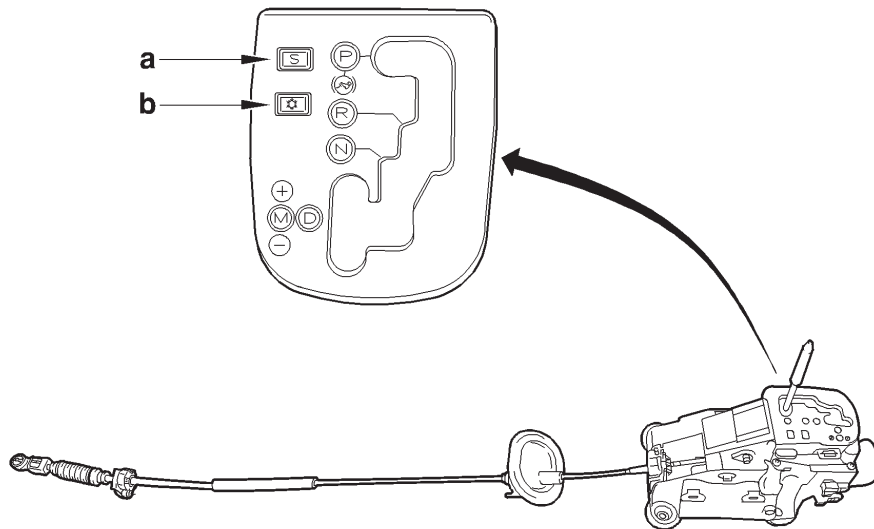
- Gear lever position switch.
- Automatic gearbox ECU.
- Electrical harnesses.
- Battery voltage.

Remove:

- The gear lever cover (**1**) (*pull upwards*).
- Unlock the «**shift lock**» by pressing at «**a**» with the aid of a screwdriver.
- Move the gear selection lever out of position «**P**».

## AL4 AUTOMATIC GEARBOX CONTROLS

Engines: NFU - RFJ



B2CP3H7D

## AL4 AUTOMATIC GEARBOX CONTROLS

Engines: NFU - RFJ

The gear selection lever is guided by the shape of the step grille and by a recall spring which holds it to the left.

The gear control has **5 positions**:

- «**P**» Parking (*locking and immobilisation of the vehicle*).
- «**R**» Reverse gear.
- «**N**» Neutral.
- «**D**» Drive (*use of the four forward gears in automatic and auto-adaptive operation*).
- «**M**» Manual (*this position allows the driver to choose his gears sequentially by pulling «**M**» or pushing «**M+**» on the gear selection lever*).

**NOTE:** Only positions «**P**» or «**N**» authorise starting of the engine.

In position «**M**», the selection is by means of an electronic sensor situated close to the selection lever.

The variation of flux necessary to affect the sensor cells is obtained by a magnet on the lever opposite the cells, provoking the changes of status.

The information on this is transmitted to the gearbox ECU.

**NOTE:** On a vehicle equipped with «**shift lock**», it is necessary to switch on the ignition and press the brake pedal to release the selection lever from position «**P**».

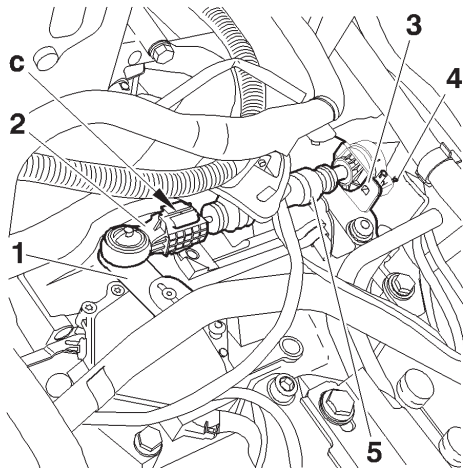
The two switches positioned on the gear control grille allow the driver to choose one of the following three driving programmes:

- **Normal programme.** The **Normal** programme operates in the absence of any other selection being made (*auto-adaptive mode ; eco law*).
- «**a**» **Sport programme.** The **Sport** programme permits a more dynamic driving style, with greater performances and acceleration.
- «**b**» **Snow programme.** The **Snow** programme facilitates moving off and traction on ground that has limited adhesion.

To revert to the **Normal** programme, you have to press a second time on the **sport** or **snow** switch.

## AL4 AUTOMATIC GEARBOX CONTROLS

Engines: NFU - RFJ



B2CP3H8C

### Gearbox end.

The automatic gearbox is controlled by a cable.

«c» Push-button

(1) Control lever with ball-joint

(2) Automatic adjustment

- Pull out the button to adjust the control.
- Push it in to lock the adjustment of the control.

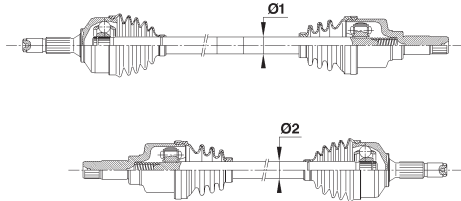
(3) Sleeve stop

(4) Selection control locking clip (5) on the sleeve stop (3)

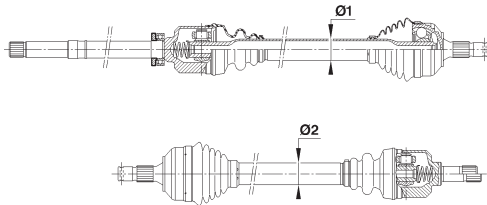
## DRIVESHAFT SPECIFICATIONS

Engines: KFU – NFU – RFN – RFJ – RFK – 9HX – 9HY– 9HZ – RHR

A



B



**NOTE:** The wheel hubs have a bearing with an integral magnetic wheel designed for the **ABS** system.

### Features.

The driveshafts no longer have crownwheels for the **ABS** system. This function is assured by the wheel bearings.

The driveshaft gaiters are fixed by means of recessed ring seals.

In the event of the driveshafts being repaired, the recessed ring seals are replaced by clips.

### Tightening torques (m.daN).

Driveshaft nuts :  $32,5 \pm 2,6$

Driveshaft bearings :  $2 \pm 0,2$

B2FP05CP

CLUTCH  
GEARBOX  
DRIVESHAFTS

## DRIVESHAFT SPECIFICATIONS

		Gearbox		Identification	
		Type	Diameter of differential	Wheel end	Gearbox end
1.4i 16V	KFU	MA/5L	77	AC 2000i	GI 2000i
1.6i 16V	NFU	MA/5N			
		AL4		RZ17,5	JB2A
2.0i 16V	RFN	BE4/5N - BE4R/5S	84		
2.0i	RFJ	AL4			
2.0i 16V	RFK	BE4/5L	84		
1.6 Hdi 16V	9HX	BE4/5L			
	9HY - 9HZ	BE4/5L			
2.0 HDi 16V	RHR	ML6C	86	RZ20	JB3AT

### CLUTCH GEARBOX DRIVESHAFTS

		Gearbox	Ball diameter (mm)		Shaft diameter (mm)		Driveshaft gaiters	
		Type	Wheel end	Gearbox end	Outer	Inner	Wheel end	Gearbox end
1.4i 16V	KFU	MA/5L	75	72	36	31	TP (1)	C/C (2)
1.6i 16V	NFU	MA/5N						
		AL4	86	78		30		
2.0i 16V	RFN	BE4/5N - BE4R/5S						
2.0i	RFJ	AL4						
2.0i 16V	RFK	BE4/5L						
1.6 HDi 16V	9HX	BE4/5L	98	94	40	33		
	9HY - 9HZ	BE4/5L						
2.0 HDi 16V	RHR	ML6C						

(1) = Thermoplastic.

(2) = Rubber.

## DRIVESHAFT - GEARBOX

			Tightening torques (m.daN)		Gearbox oil seal mandrels		
Vehicle	Gearbox	Engines	Driveshaft bearing	Driveshaft nut	RH side	LH side	Tool kit
C4	MA/5	KFU - NFU	2 ± 0,2	32,5 ± 2,6	7114-T.W	7114-T.X	7116-T
	BE4/5	RFN - RFK 9HX - 9HY - 9HZ			7114-T.W	7114-T.X	7116-T
	ML6	RHR			9017-T.C	5701-T.A	9017-T
	AL 4	NFU - RFJ			(-) 0338 J1 + (-) 0338 J3	(-) 0338 H1 + (-) 0338 H2	(-) 0338

Tightening torques for the wheel bolts (m.daN).

CITROËN C4	Steel	9 ± 1
	Aluminium	

CLUTCH  
GEARBOX  
DRIVESHAFTS



## WHEEL AND TYRES

**(1) = Normal operating pressure**  
(max. 4 persons in the vehicle  
and 40 Kg in the boot).

**Petrol 3-door**

**1.4i 16V**  
**Level 1 - Level 2**

**2.0i 16V**  
**Level 2 - Level 4**

**Level 4**

**Engine type**

**KFU**

**RFN**

**RFK**

**Tyre  
Circumference**

**S**

195/65 R15 91H - 1,934 m

205/55 R16 90V - 1,924 m

205/50 R17 89W - 1,941 m

**Wheel**

**T**

6 J15 4-27  
Embellishers Eole

**A**

6 1/2J16 CH4-26  
Rims Radicale

6 1/2J17 4-26  
Rims Resolfen

**Pressure** **Front/Rear**

**(1)**

2,4 / 2,4 bars

**Tyre  
Circumference**

**O**

205/50 R17 89W - 1,941 m

**Wheel**

**T**

**A**

6 1/2J17 4-26  
Rims Resolfen  
Rims Toka Toka

**Spare wheel**

**T**

195/65 R15 91H

6 J15 4-27

205/55 R16 90V  
6 1/2J16 4-26

**Pressure**

2,7 bars

**Symbols and abbreviations used: S = Standard fitting.**

**T = Steel wheel.**

**O = Optional fitting.**

**A = Alloy wheel.**

## WHEEL AND TYRES

**(1) = Normal operating pressure**  
(max. 4 persons in the vehicle  
and 40 Kg in the boot).

**Petrol 3-door**

**1.6i 16V - Manual and Auto.  
Level 1 - Level 4**

Engine type		NFU			
Tyre Circumference	S	195/65 R15 91H - 1,934 m	205/55 R16 90V - 1,924 m		205/50 R17 89W - 1,941 m
Wheel	T	6 J15 4-27 Embellishers Eole	6 1/2J16 CH4-26 Embellishers Azzana		
	A			6 1/2J17 4-26 Rims Radicale	6 1/2J17 4-26 Rims Resolfen
Pressure	Front/Rear	(1)	2,4 / 2,4 bars		
Tyre Circumference	O	205/55 R16 90V - 1,924 m	205/50 R17 89W - 1,941 m		
Wheel	T				
	A	6 1/2J16 CH4-26 Rims Radicale	6 1/2J17 4-26 Rims Resolfen/Rims Toka Toka		
Spare wheel	T	195/65 R15 91H		6 J15 4-27	
Pressure		2,7 bars			

**Symbols and abbreviations used:** S = Standard fitting.

T = Steel wheel.

O = Optional fitting.

A = Alloy wheel.

WHEEL AND TYRES						
(1) = Normal operating pressure (max. 4 persons in the vehicle and 40 Kg in the boot).		Diesel 3-door				
		1.6 HDi 16V Level 1 - Level 3				
Engine type		9HY			9HZ	
Tyre Circumference	S	205/55 R16 90V 1,924 m	205/50 R17 89W 1,941 m	205/55 R16 90V - 1,924 m	205/50 R17 89W 1,941 m	
Wheel	T	6 1/2J16 4-26 Embellishers Azzana		6 1/2J16 4-26 Embellishers Azzana		
	A		6 1/2J17 4-26 Rims Resolfen	6 1/2J16 CH4-26 Rims Radicale	6 1/2J17 4-26 Rims Resolfen	
Pressure	Front/Rear	(1)	2,4 / 2,4 bars			
Tyre Circumference	O	205/55 R16 90V 1,924 m		205/55 R16 90V - 1,924 m 205/50 R17 89W - 1,941 m		
Wheel	T					
	A	6 1/2J16 CH4-26 Rims Radicale		6 1/2J16 CH4-26 Rims Radicale 6 1/2J17 4-26 Rims Resolfen Rims Toka Toka		
Spare wheel	T	195/65 R15 91H			6 J15 4-27	
Pressure		2,7 bars				
Symbols and abbreviations used: S = Standard fitting. T = Steel wheel. O = Optional fitting. A = Alloy wheel.						

## WHEEL AND TYRES

**(1) = Normal operating pressure**  
(max. 4 persons in the vehicle  
and 40 Kg in the boot).

**Diesel 3-door**

**1.6 HDi 16V**  
**Level 1 - Level 3**

**2.0 HDi 16V**  
**Level 3 - Level 4**

Engine type		9HX		RHR	
Tyre Circumference	S	195/65 R15 91H 1,934 m	205/55 R16 90V 1,924 m	205/55 R16 90V 1,924 m	205/50 R17 89W 1,941 m
Wheel	T	6 J15 4-27 Embellishers Eole			
	A		6 1/2J16 CH4-26 Rims Radicale	6 1/2J16 CH4-26 Rims Radicale	6 1/2J17 4-26 Rims Resolfen
Pressure	Front/Rear	(1)	2,4 / 2,4 bars		
Tyre Circumference	O	205/55 R16 90V 1,924 m	205/50 R17 89W 1,941 m	205/50 R17 89W 1,941 m	
Wheel	T	6 1/2J16 4-26 Embellishers Azzana			
	A	6 1/2J16 CH4-26 Rims Radicale	6 1/2J17 4-26 Rims Resolfen Rims Toka Toka	6 1/2J17 4-26 Rims Resolfen Rims Toka Toka	
Spare wheel	T	195/65 R15 91H	6 J15 4-27	205/55 R16 90V	6 1/2J16 4-26
Pressure		2,7 bars			

**Symbols and abbreviations used:** S = Standard fitting.

T = Steel wheel.

O = Optional fitting.

A = Alloy wheel.

WHEEL AND TYRES						
(1) = Normal operating pressure (max. 4 persons in the vehicle and 40 Kg in the boot).			Petrol 5-door			
			1.4i 16V Level 1 - Level 2	2.0i 16V Level 2 - Level 4		2.0i Level 3 - Level 4
Engine type			KFU	RFN		RFJ
Tyre Circumference		S	195/65 R15 91H - 1,934 m	205/55 R16 90V - 1,924 m	205/50 R17 89W - 1,941 m	
Wheel		T	6 J15 4-27 Embellishers Eole			
		A		6 1/2J16 CH4-26 Rims Radicale	6 1/2J17 4-26 Rims Resolfen	
Pressure	Front/Rear	(1)	2,4 / 2,4 bars			
Tyre Circumference		O		205/50 R17 89W - 1,941 m		
Wheel		T				
		A		6 1/2J17 4-26 Rims Toka Toka		
Spare wheel		T	195/65 R15 91H		6 J15 4-27	
Pressure			2,7 bars			
Symbols and abbreviations used: S = Standard fitting.                      T = Steel wheel.                      O = Optional fitting.                      A = Alloy wheel.						

## WHEEL AND TYRES

**(1) = Normal operating pressure**  
(max. 4 persons in the vehicle  
and 40 Kg in the boot).

**Petrol 5-door**

**1.6i 16V - BVM/BVA**

**Level 1 - Level 4 / Level 2 - Level 4**

Engine type		NFU				
Tyre Circumference		S	195/65 R15 91H - 1,934 m	205/55 R16 90V - 1,924 m		205/50 R17 89W - 1,941 m
Wheel		T	6 J15 4-27 Embellishers Eole			
		A		6 1/2J16 CH4-26 Rims Radicale	6 1/2J16 CH4-26 Rims Toka Toka	6 1/2J17 4-26 Rims Resolfen
Pressure	Front/Rear	(1)	2,4 / 2,4 bars			
Tyre Circumference		O	205/55 R16 90V - 1,924 m	205/50 R17 89W - 1,941 m		
Wheel		T	6 1/2J16 4-26 Embellishers Azzana			
		A	6 1/2J16 CH4-26 Rims Radicale	6 1/2J17 4-26 Rims Toka Toka		
Spare wheel		T	195/65 R15 91H			

**Symbols and abbreviations used:** S = Standard fitting.

T = Steel wheel.

O = Optional fitting.

A = Alloy wheel.

## WHEEL AND TYRES

**(1) = Normal operating pressure**  
(max. 4 persons in the vehicle  
and 40 Kg in the boot).

**Diesel 5-door**

**1.6 HDi 16V**  
**Level 2 - Level 4**

Engine type		9HY		9HZ		
Tyre Circumference		S	205/55 R16 90V - 1,924 m		205/55 R16 90V - 1,924 m	205/50 R17 89W 1,941 m
Wheel		T	6 1/2J16 4-26 Embellishers Azzana		6 1/2J16 4-26 Embellishers Azzana	
		A		6 1/2J16 CH4-26 Rims Radicale	6 1/2J16 CH4-26 Rims Radicale	6 1/2J17 4-26 Rims Resolfen
Pressure	Front/Rear	(1)	2,4 / 2,4 bars			
Tyre Circumference		O	205/55 R16 90V – 1,924 m		205/50 R17 89W - 1,941 m	
Wheel		T				
		A	6 1/2J16 CH4-26 Rims Radicale		6 1/2J17 4-26 Rims Toka Toka	
Spare wheel		T	195/65 R15 91H		6 J15 4-27	
Pressure			2,7 bars			

**Symbols and abbreviations used:** S = Standard fitting.

T = Steel wheel.

O = Optional fitting.

A = Alloy wheel.

## WHEEL AND TYRES

(1) = Normal operating pressure (max. 4 persons in the vehicle and 40 Kg in the boot).		Diesel 5-door		
		1.6 HDi 16V Level 1 - Level 3		
Engine type		9HX		
Tyre Circumference	S	195/65 R15 91H – 1,934 m	205/55 R16 90V – 1,924 m	205/50 R17 89W – 1,941 m
Wheel	T	6 J15 4-27 Embellishers Eole		
	A		6 1/2J16 CH4-26 Rims Radicale	6 1/2J17 4-26 Rims Radicale
Pressure	Front/Rear	(1)	2,4 / 2,4 bars	
Tyre Circumference	O	205/55 R16 90V – 1,924 m	205/50 R17 89W – 1,941 m	
Wheel	T	6 1/2J16 4-26 Embellishers Azzana		
	A	6 1/2J16 CH4-26 Rims Radicale	6 1/2J17 4-26 Rims Toka Toka	
Spare wheel	T	195/65 R15 91H		6 J15 4-27
Pressure		2,7 bars		

**Symbols and abbreviations used:** **S** = Standard fitting.    **T** = Steel wheel.    **O** = Optional fitting.    **A** = Alloy wheel.



WHEEL AND TYRES				
(1) = Normal operating pressure (max. 4 persons in the vehicle and 40 Kg in the boot).		Diesel 5-door		
		2.0 HDi 16V Level 3 - Level 4		
Engine type		RHR		
Tyre Circumference	S	205/55 R16 90V - 1,924 m	205/50 R17 89W - 1,941 m	
Wheel	T			
	A	6 1/2J16 CH4-26 Rims Radicale	6 1/2J17 4-26 Rims Resolfen	
Pressure	Front/Rear	(1)	2,4 / 2,4 bars	
Tyre Circumference	O	205/50 R17 89W - 1,941 m		
Wheel	T			
	A	6 1/2J17 4-26 Rims Toka Toka		
Spare wheel	T	205/55 R16 90V	6 1/2J16 4-26	
Pressure		2,7 bars		
Symbols and abbreviations used: S = Standard fitting.                      T = Steel wheel.                      O = Optional fitting.                      A = Alloy wheel.				

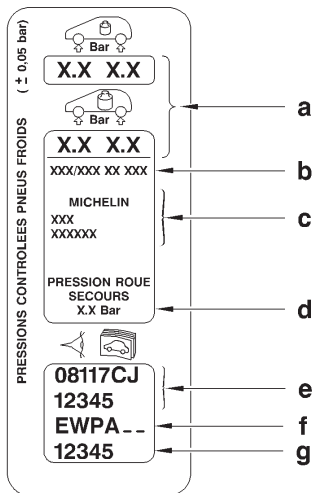
## WHEEL AND TYRES

### Inflation pressures

		Normal operating pressure						Pressure under load «Max.»	
				Pressure (Bars)					
		Front	Rear	Spare wheel	Front	Rear	Spare wheel		
Tyre dimension	Engine version								
195/65 R15 91H	KFU - NFU - 9HX	2,4	2,4	2,7	2,4	2,7	2,7		
205/55 R16 90C	NFU - RFN - 9HX 9HY - 9HZ - RHR								
205/50 R17 89W	NFU - RFN - RFJ RFK - 9HX - 9HY 9HZ - RHR								

## WHEEL AND TYRES

## Identification of inflation pressures



**NOTE:** The label indicating the recommended tyre pressures is affixed, driver's side, on the vehicle front pillar or on the front door edge.

«a» Recommended tyre inflation pressures (*empty and under load*)

«b» Tyre specifications

«c» Type of tyres

«d» Recommended inflation pressure for the spare wheel

«e» After Sales/Replacement Parts no.

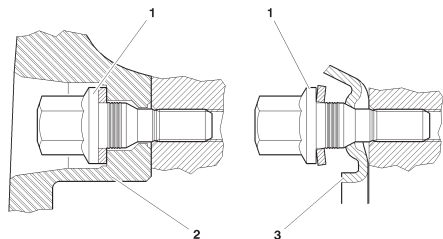
«f» Paint code

«g» Serial no. (*for factory use*)

B2GP01JD

## WHEEL AND TYRES

### Identification of the wheel bolts



(1)  
(2)  
(3)

: Wheel bolt (*all rim types*)  
: Light alloy wheel  
: Steel aluminium wheel

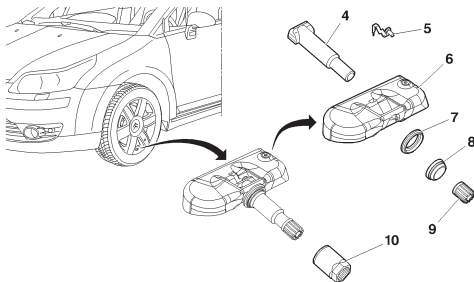
Tightening torque for wheel bolts.

$9 \pm 1 \text{ m.daN.}$

B2GP00JD

## WHEEL AND TYRES

### Deflation detection system (according to trim level)



- (4) Valve
- (5) Antenna
- (6) HF transmitter unit
- (7) Washer

- (8) Seal
- (9) Cap
- (10) Nut

#### Composition.

A **SIEMENS HF** transmitter module (6) integral to each wheel in the place of the valve, each including a lithium battery.

An **HF** receiver in the communication module under the dashboard.

**WARNING:** Each time a tyre is replaced, it is necessary to replace the valve (4).

**WARNING:** Each time a wheel rim is replaced, it is necessary to replace the seal (8).

**WARNING:** Each time a transmitter module is changed, it is necessary to have the replacement recognised by the deflation detection **ECU**, using a diagnostic tool.

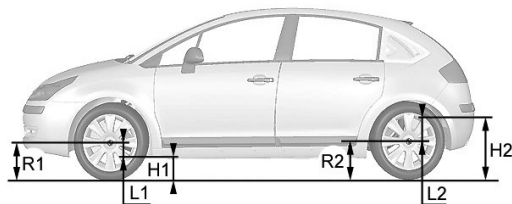
B2GP01GD

## AXLE GEOMETRY

### Conditions for checking and adjusting

**Tools** : [1] Gauge for measuring the the wheel radius, 4 bolts : 4300-T.  
 Tyres inflated to correct pressures. Vehicle at reference height.  
 Steering rack locked at mid point (*see corresponding operation*).

### Vehicle heights at reference height



E1AP0F3D

#### Front height

L1

$$H1 = R1 - L1$$

**H1** = Measurement between the measuring zone underneath the front sub-frame and the ground.

**R1** = Front wheel radius under load.

**L1** = Distance between the wheel axis and the measuring zone underneath the front subframe.

#### Rear height

L2

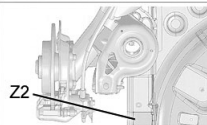
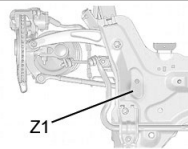
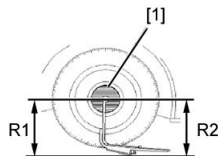
$$H2 = R2 + L2$$

**H2** = Measurement between the measuring zone underneath the rear sill and the ground.

**R2** = Rear wheel radius under load.

**L2** = Distance between the wheel axis and the measuring zone underneath the rear sill.

## AXLE GEOMETRY



B3CP097D

### Measuring front height

### Measuring rear height

**Tools** : [1] Gauge for measuring the the wheel radius, 4 bolts

: 4300-T

**Z1** = Measuring zone underneath the front subframe

**Z2** = Measuring zone underneath the rear sill.

Measure the radius of the front wheel **R1**/Calculate dimension **H1 = R1 - L1**

Measure the radius of the rear wheel **R2**/Calculate dimension **H2 = R2 + L2**

Value at reference  
height  
(+ 10 - 8 mm)

All types  
(except CRD) (\*)  
**L1 = 144 mm**

CRD vehicles (\*)  
**L1 = 124 mm**

Value at reference  
height  
(+ 12 - 10 mm)

All Types (except  
Entreprise and CRD) (\*)  
**L2 = 68 mm**

Entreprise  
vehicles  
**L2 = 48 mm**

CRD vehicles  
(\*)  
**L2 = 88 mm**

(\*) = **CRD**: Difficult road conditions: definition for a type of vehicle with axles and suspension designed for driving on rough roads.  
Compress the suspension to obtain the calculated values.  
The height difference between the two axle dimensions should be less than **10 mm**.

## AXLE GEOMETRY

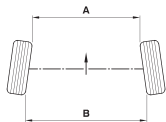
### Front axle

Dissymmetry of lower castor at  $0^{\circ} 30'$ .

Dissymmetry of lower camber  $0^{\circ} 30'$ .

Distribute symmetrically, LH / RH wheel, the total tracking value.

Engines		KFU - NFU 9HX - 9HY - 9HZ	RFJ - RFN 9HX - 9HY - 9HZ	RHR	RFJ - RFN - RFK 9HX - 9HY - 9HZ - RHR
Tyres		195/65 R 15	205/55 R 16		205/50 R 17
Camber (± 0° 30')	Non adjustable	0°			
Castor (± 0° 30')		5°	5° 09'		5° 12'
Pivot angle (± 0° 30')		11° 41'			
Tracking	Adjustable	- 2,5 ± 1 mm			
		- 0° 23' ± 0° 09'	- 0° 21' ± 0° 09'		- 0° 20' ± 0° 08'



**NOTE:** Front of the vehicle (following arrow).

B3CP02UC

**A < B** = Positive figure:

**A > B** = Negative figure:

### WARNING

+ =

TOE-IN

- =

TOE-OUT

AXLES  
SUSPENSION  
STEERING

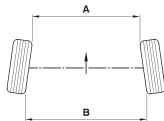


## AXLE GEOMETRY

### Rear axle

Dissymmetry of lower camber  $0^{\circ} 30'$ .

Engines		KFU - NFU 9HX - 9HY - 9HZ	RFJ - RFN - RHR 9HX - 9HY - 9HZ	RFJ - RFN - RFK 9HX - 9HY - 9HZ - RHR
Tyres		195/65 R 15	205/55 R 16	205/50 R 17
Camber ( $\pm 0^{\circ} 30'$ )	Non adjustable	$1^{\circ} 45'$		
Push angle ( $\pm 0^{\circ} 06'$ )		$0^{\circ}$		
Tracking	Adjustable	$6,5 \pm 1 \text{ mm}$		
		$0^{\circ} 59' \pm 0^{\circ} 09'$	$0^{\circ} 55' \pm 0^{\circ} 09'$	$0^{\circ} 52' \pm 0^{\circ} 08'$



**NOTE:** Front of the vehicle (following arrow).

B3CP02UC

### WARNING

**A < B** = Positive figure:

+ =

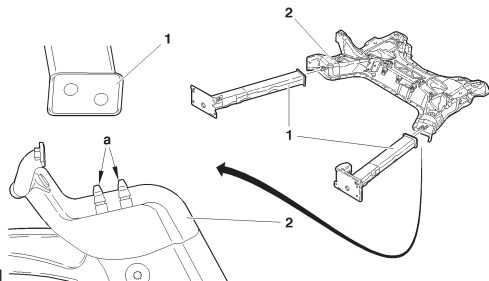
TOE-IN

**A > B** = Negative figure:

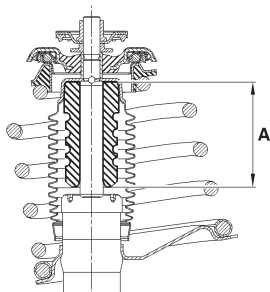
- =

TOE-OUT

## GENERAL SPECIFICATIONS: FRONT AXLE



B3CP08UD



B3BP190C

### Subframe

#### (1) Subframe extensions

Subframe extensions lodged on two pins «a», subframe end.

Subframe extensions screwed on the lower crossmember and body at the front

#### (2) Subframe

Subframe machine-welded and painted.

Subframe positioned by indexing on the body.

### Pivot

Pivot of «pinched» type.

Pivot bearing: Diameter **82 mm**.

Bearing with double row of balls, with integral magnetic wheel (*48 pairs of poles*).

Pivot lower ball-joint is removable.

### Anti-roll bar

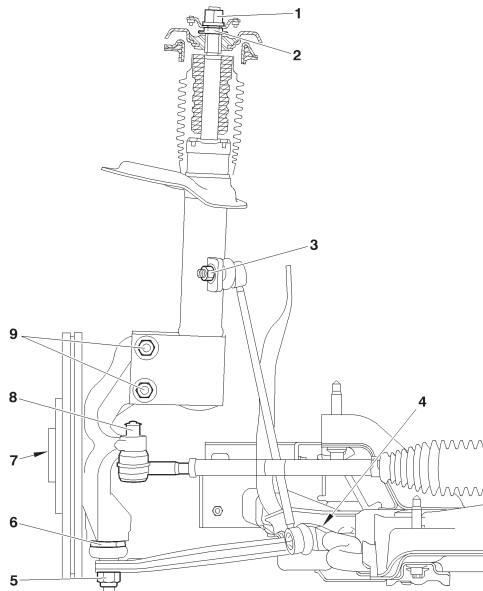
Engines	Diameter (mm)	Colour
KFU-NFU-RFJ-RFN 9HX-9HY-9HZ-RHR	21.5	Pink
RFK-RHR	22	White

### Suspension leg

Front axle with independent wheels, of pseudo «Mac Pherson» type.

Suspension travel: **height A = 96 mm**.

## TIGHTENING TORQUES: FRONT AXLE

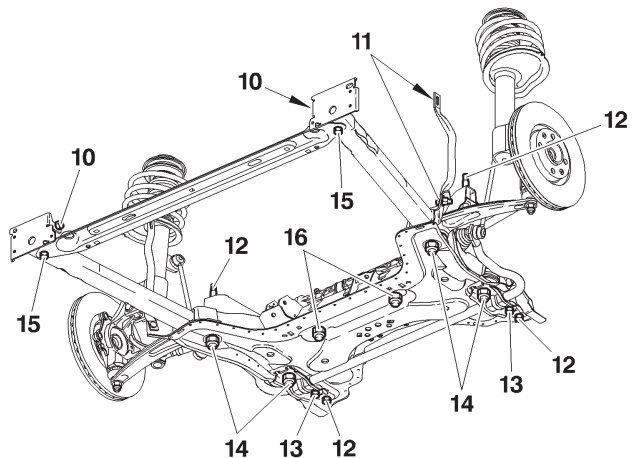


B3BP18ZP

### Tightening torques (m.daN).

(1) Nut fixing suspension leg on body	: $6,9 \pm 0,6$
(2) Nut fixing upper damper cup	: $6,9 \pm 0,6$
(3) Upper fixing of anti-roll bar rod	: $3,6 \pm 0,3$
(4) Lower fixing of anti-roll bar rod	: $3,6 \pm 0,3$
(5) Nut fixing pivot lower ball-joint	: $4,2 \pm 0,4$
(6) Fixing of pivot lower ball-joint on pivot	: $23 \pm 2,3$
(7) Hub nut	: $32,5 \pm 2,6$
(8) Steering ball-joint on pivot	: $3,5 \pm 0,3$
(9) Fixing of suspension leg on pivot	: $9 \pm 0,9$

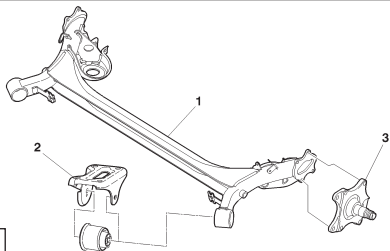
## TIGHTENING TORQUES: FRONT AXLE



### Tightening torques (m.daN).

- |  |                 |
|--|-----------------|
| (10) Fixing of subframe extension on body        | : $5,1 \pm 1,2$ |
| (11) Fixing of tie-rod on body                   | : $1,8 \pm 0,4$ |
| (12) Tie-rod screw on front subframe             | : $9,8 \pm 0,9$ |
| (13) Fixing of anti-roll bar bearing on subframe | : $10,4 \pm 1$  |
| (14) Fixing of lower suspension arm on subframe  | : $11,1 \pm 1$  |
| (15) Fixing of subframe extension on body        | : $8,5 \pm 0,8$ |
| (16) Fixing of steering mechanism on subframe    | : $8 \pm 0,8$   |

## GENERAL SPECIFICATIONS: REAR AXLE



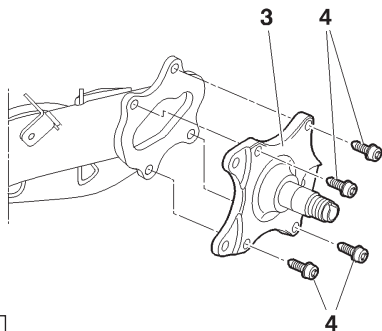
B3DP0BFD

### Subframe

- (1) Rear axle crossmember  
 (2) Yoke fixing rear axle crossmember on body  
 Rear axle machine-welded, of trailing arm type with rear axle deformable.

### Stub axle

- (3) Stub axle  
 Stub axle connected on the rear axle, fixed by **4 screws (4)**.  
 Diameter of stub axle: **25 mm**.



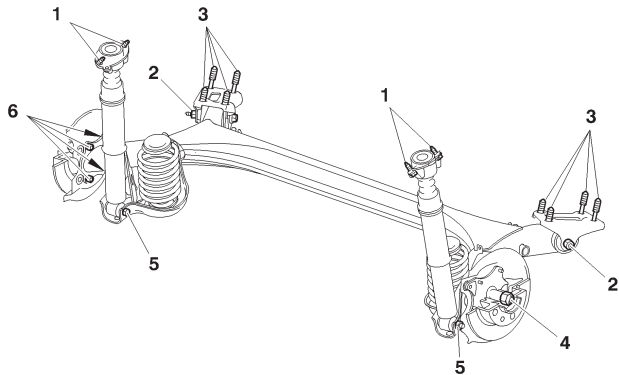
B3DP0BGC

Anti-roll bar.  
 The anti-roll bar is inside the rear axle crossmember.  
 The anti-roll bar is a component that cannot be removed (*extremities welded on the rear axle crossmember*).

### Anti-roll bars

Engines	Diameter (mm) (interior x exterior)	Crossmember plate thickness (mm)
KFU-NFU-RFJ-RFN 9HX-9HY-9HZ	21x27	5
RFK		6
RHR	21x	

## TIGHTENING TORQUES: REAR AXLE

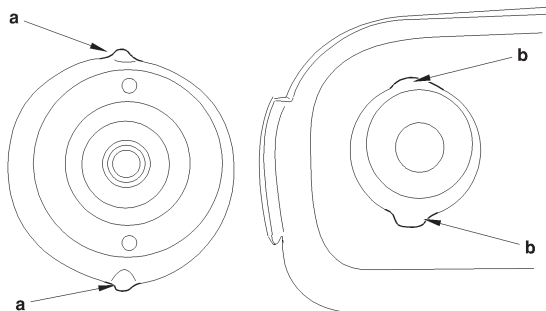


### Tightening torques (m.daN).

(1) Damper upper fixing	: $5,8 \pm 0,5$
(2) Fixing of yoke on rear axle	: $7,6 \pm 0,7$
(3) Fixing of rear axle yoke on body	: $6,2 \pm 0,6$
(4) Stub axle bearing nut	
Pre-tightening	: $9 \pm 0,9$
Angular tightening	: $29^\circ \pm 5^\circ$
(5) Damper lower fixing	: $6 \pm 0,6$
(6) Fixing of stub axle carrier on rear axle	: $6,3 \pm 0,6$

## GENERAL SPECIFICATIONS: SUSPENSION

### Suspension leg angle



B3BP19QD

### Front axle

Position the bosses «a» of the damper support in the slots «b» in the wheelarch.

### Anti-roll bars

Engines	Diameter (mm)	Colour
KFU NFU RFJ RFN 9HX 9HY 9HZ	21,5	Pink
RFK RHR	22	White

### Rear axle

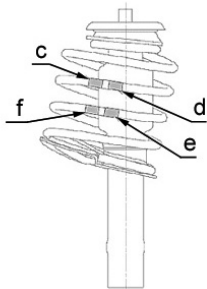
The anti-roll bar is inside the rear axle crossmember.

The anti-roll bar is a component that cannot be removed (*extremities welded on the rear axle crossmember*).

### Anti-roll bars

Engines	Diameter (mm)	Crossmember plate thickness (mm)
KFU NFU RFJ RFN 9HX 9HY 9HZ	21x27	5
RFK	24x30	6
RHR	21x27	

## GENERAL SPECIFICATIONS: SUSPENSION



B3BP19SC

### Front suspension spring

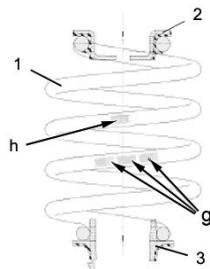
Colour reference at «f».

Supplier: **ARA** : Blue.

Supplier: **KRUPP** : Violet.

Colour reference at «e»-«c», «d».

Depending on vehicle trim levels (*see corresponding operations*).



B3BP19TC

### Rear suspension spring

(1) Suspension spring

(2) Upper cup in elastomer

(3) Lower cup in elastomer

«g» Colour marking zone on a central coil

«h» Supplier colour reference (\*).

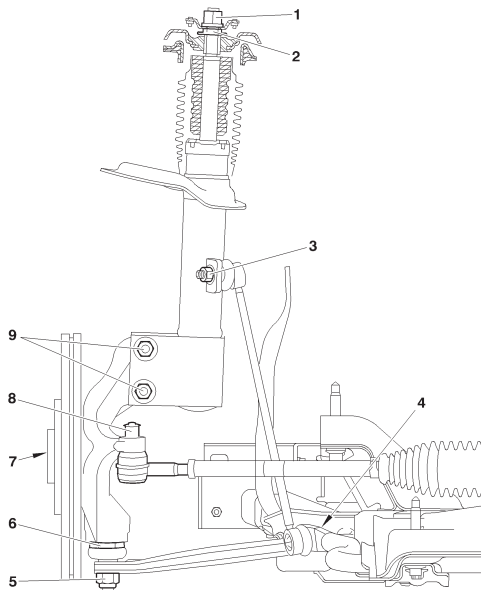
(\*) Colour reference.

Supplier: **MUBEA** : None.

Supplier: **KRUPP** : Violet.



## TIGHTENING TORQUES: SUSPENSION



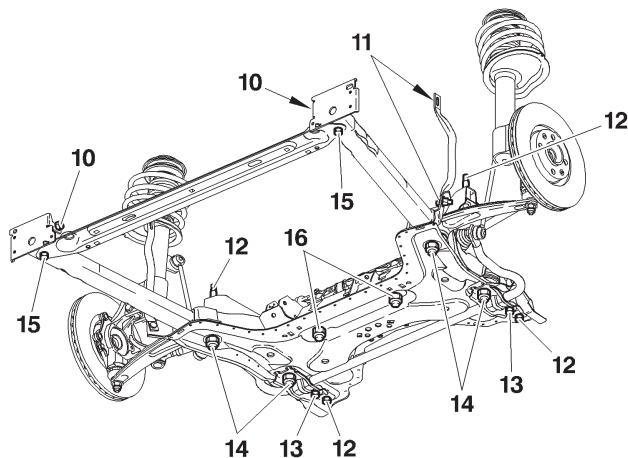
B3BP18ZP

### Suspension leg

#### Tightening torques (m.daN).

(1) Nut fixing suspension leg on body	: $6,9 \pm 0,6$
(2) Nut fixing upper damper cup	: $6,9 \pm 0,6$
(3) Upper fixing of anti-roll bar rod	: $3,6 \pm 0,3$
(4) Lower fixing of anti-roll bar rod	: $3,6 \pm 0,3$
(5) Nut fixing pivot lower ball-joint	: $4,2 \pm 0,4$
(6) Fixing of pivot lower ball-joint on pivot	: $23 \pm 2,3$
(7) Hub nut	: $32,5 \pm 2,6$
(8) Steering ball-joint on pivot	: $3,5 \pm 0,3$
(9) Fixing of suspension leg on pivot	: $9 \pm 0,9$

## TIGHTENING TORQUES: SUSPENSION



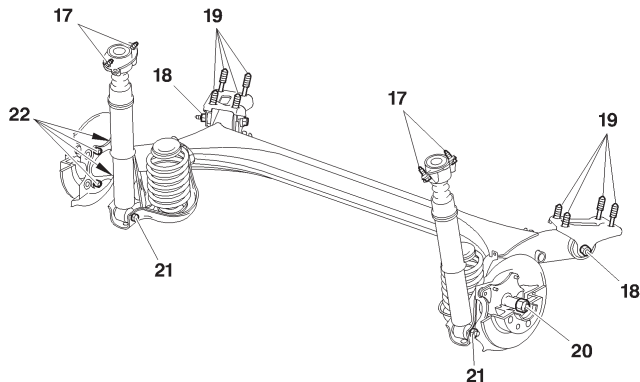
B3CP08TD

### Subframe

#### Tightening torques (m.daN).

(10) Fixing of subframe extension on body	: $5,1 \pm 1,2$
(11) Fixing of tie-rod on body	: $1,8 \pm 0,4$
(12) Tie-rod screw on front subframe	: $9,8 \pm 0,9$
(13) Fixing of anti-roll bar bearing on subframe	: $10,4 \pm 1$
(14) Fixing of lower suspension arm on subframe	: $11,1 \pm 1$
(15) Fixing of subframe extension on body	: $8,5 \pm 0,8$
(16) Fixing of steering mechanism on subframe	: $8 \pm 0,8$

## TIGHTENING TORQUES: SUSPENSION

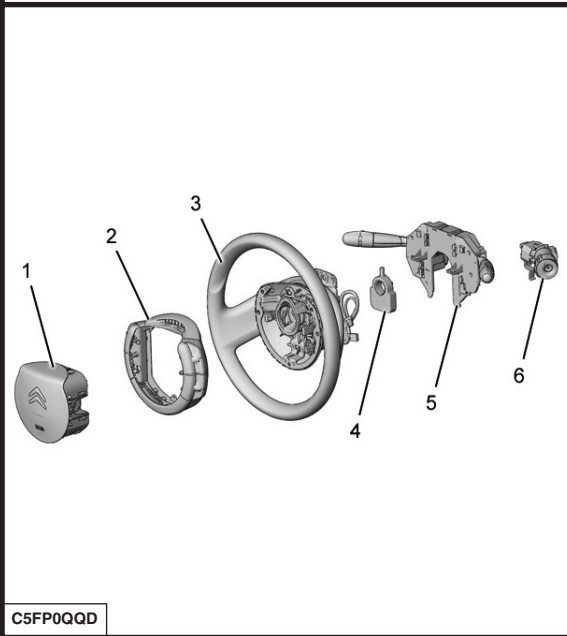


B3DP0BDD

### Tightening torques (m.daN).

(1) Damper upper fixing	: $5,8 \pm 0,5$
(2) Fixing of yoke on rear axle	: $7,6 \pm 0,7$
(3) Fixing of rear axle yoke on body	: $6,2 \pm 0,6$
(4) Stub axle bearing nut	
Pre-tightening	: $9 \pm 0,9$
Angular tightening	: $29^\circ \pm 5^\circ$
(5) Damper lower fixing	: $6 \pm 0,6$
(6) Fixing of stub axle carrier on rear axle	: $6,3 \pm 0,6$

# GENERAL SPECIFICATIONS: POWER-ASSISTED STEERING STEERING

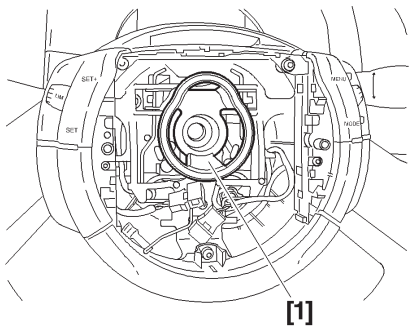


C5FP0QQD

Reference	Description
1	Driver's airbag
2	Controls on the steering wheel
3	Fixed central controls steering wheel
4	Steering wheel angle sensor
5	Controls on the steering wheel
6	Ignition / steering lock

## GENERAL SPECIFICATIONS: POWER-ASSISTED STEERING

### Fixed central controls steering wheel



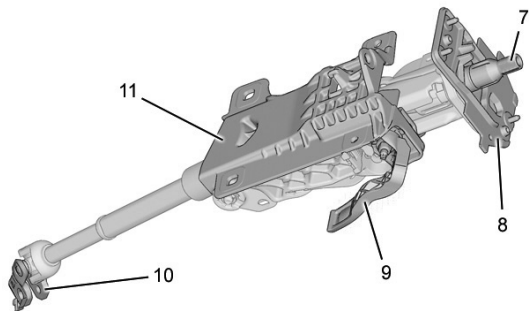
[1] Tool for locking the fixed central controls steering wheel : 9702-T

**WARNING:** The mechanism of the fixed central controls steering wheel cannot be dismantled.

C5FP0QRC

## GENERAL SPECIFICATIONS: POWER-ASSISTED STEERING

### Steering column



Reference	Description
7	Fixing of the fixed central controls steering wheel on the steering column shaft
8	Steering column interface
9	Locking handle
10	Fixing of the steering cardan on the distributor valve stem
11	Steering column support

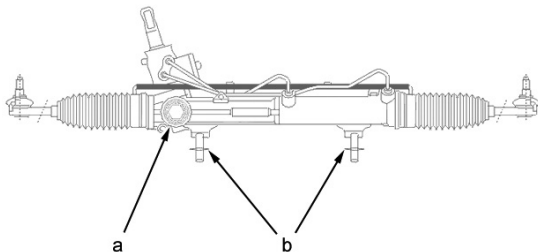
The steering column is in aluminium.

The adjustment of the steering column for height and reach is by means of the handle (9).

B3EP16PD

## GENERAL SPECIFICATIONS: POWER-ASSISTED STEERING

## Steering mechanism



- Steering mechanism with integral ram, fixed on the subframe by means of two studs.
- The distributor valve has groove technology.
- The hydraulic supply and return pipes are fixed on the distributor valve by a flange.
- The adjustment of the steering push-rod is via a screw plug «a», in plastic material.

**IMPERATIVE:** The toothed washers «b» must be placed between the steering mechanism and the front subframe.

B3EP16QD

	All engine types (except RHR)	RHR
Steering rack travel (mm)	74x2	69x2
Number of teeth on the distributor valve pinion	9	
Steering ratio	1/40	
Number of rotations of steering wheel (from lock to lock)	2,88	
Inner angle of lock	38° 27'	
Outer angle of lock	32° 23'	

## GENERAL SPECIFICATIONS: POWER-ASSISTED STEERING

### Steering assistance circuit

The degree of steering assistance varies as a function of the following parameters:

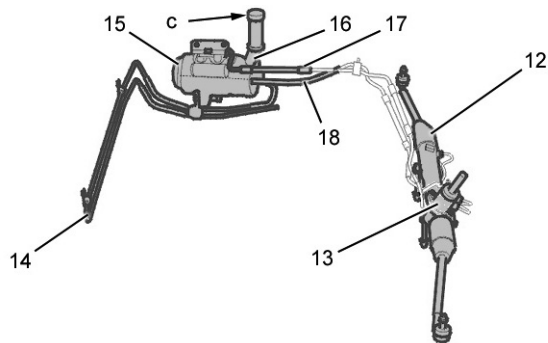
- The speed of the vehicle.
- The speed of rotation of the steering wheel.

Power steering oil : **TOTAL FLUIDE LDS H 50126.**

Quantity of oil in the power steering circuit : **0,85 Litre.**

#### Checks.

Checking the level of power steering fluid is by means of the gauge cap at «C».

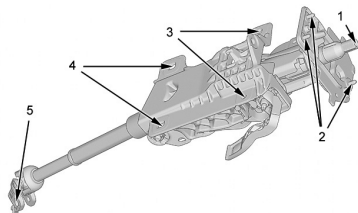


Ref.	Description
12	Power steering mechanism with integral ram
13	Distributor valve
14	Steering oil radiator fitted in the front panel ( <i>only in driving school version</i> )
15	Power steering electropump, installed on the front RH chassis member
16	Power steering oil reservoir
17	High pressure pipe
18	Low pressure pipe

B3EP16RD



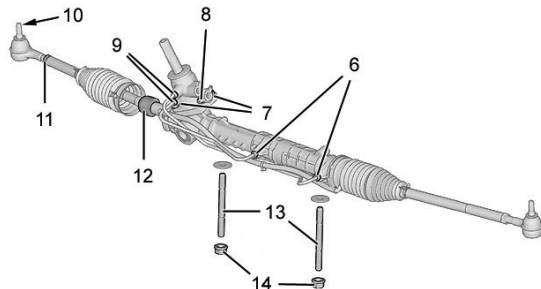
## TIGHTENING TORQUES: POWER-ASSISTED STEERING



B3EP176D

### Steering column

Ref.	Description	Tightening
1	Fixed central controls steering wheel screw	$2,2 \pm 0,2$
2	Steering column interface nuts	
3	Upper nuts	
4	Lower nuts	
5	Fixing of steering cardan on valve stem	

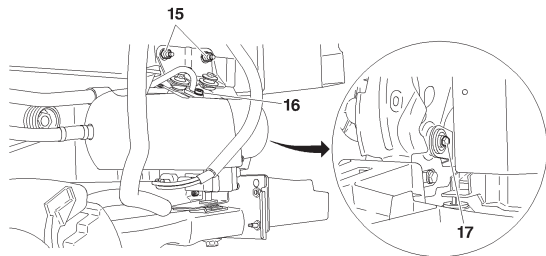


B3EP177D

### Steering mechanism with integral ram

Ref.	Description	Tightening
6	Union of hydraulic pipe on ram	$0,8 \pm 0,1$
7	Fixing of distributor valve on steering mechanism	$1,5 \pm 0,1$
8	Fixing of bracket on distributor valve	$2 \pm 0,2$
9	Union of hydraulic pipe on distributor valve	$0,8 \pm 0,1$
10	Steering ball-joint nut	$3,5 \pm 0,3$
11	Locking nut for adjustment of steering track rods	$5,5 \pm 0,5$
12	Fixing of ball-joint on steering rack	$7 \pm 0,7$
13	Stud on steering mechanism	$0,8 \pm 0,1$
14	Nut fixing mechanism on subframe	$8 \pm 0,8$

## TIGHTENING TORQUES: POWER-ASSISTED STEERING



B3EP178D

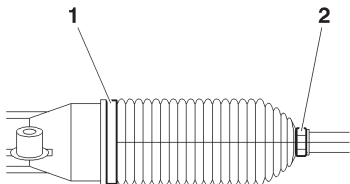
### Steering assistance electrovalve

Ref.	Description	Tightening
15	Fixing of electrovalve on chassis member	$2,3 \pm 0,2$
16	Screw fixing bracket on electrovalve	$2 \pm 0,2$
17	Fixing of electrovalve on chassis member	$2,2 \pm 0,2$

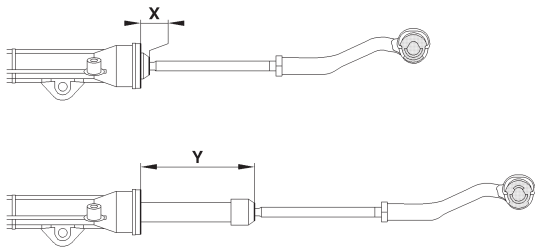
## SPECIAL FEATURES: STEERING

Engines: KFU - NFU - RFN - RFJ - RFK - 9HX - 9HY - 9HZ - RHR

### Setting the steering rack mid-point



B3EP13UC



B3EP13VD

#### Preliminary operation.

Raise and support the vehicle on a **two-column** lift.

Remove (*on RH side*):

- The clip **(1)**.
- The clip **(2)**.

Detach the steering rack protection gaiter.

#### Setting.

Move the steering to full left hand lock.

Measure the dimension **X**.

Move the steering to full right hand lock.

Measure the dimension **Y**.

Calculate the dimension

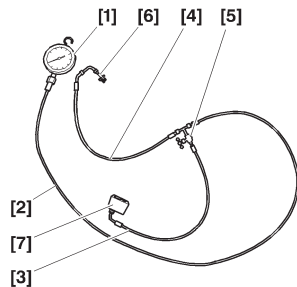
$$: L = (Y - X): 2.$$

Position the steering rack to the dimension "**L**" (*mid-point of the steering rack*).

Refit:

- The protection gaiter.
- The clip **(1)** (*New*) and the clip **(2)**.

## CHECKING THE POWER STEERING ASSISTANCE PRESSURE



B3EP16CC

### Tools.

[1] Pressure gauge	: (-).0710.AZ
[2] Checking tube: pressure gauge to tap	: (-).0710.B1
[3] Checking tube: high pressure pipe to tap	: (-).0710.B2
[4] Checking tube: high pressure pump to tap	: (-).0710.B3
[5] 3-way tap	: (-).0710.C
[6] Union	: (-).0710.J
[7] Union	: (-).0710.K
[8] Plugs for checking valve sealing	: (-).0710.H

### Precautions to be taken.

Work with care to avoid entry of polluting particles into the circuit.

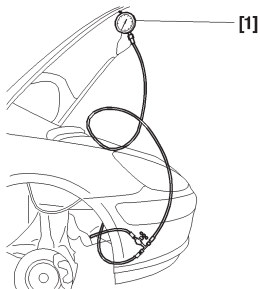
**NOTE:** The correct operation of the system requires perfect cleanliness of the fluid and of the hydraulic components.

Check:

- The level of the power steering fluid.
- The condition of the piping and unions.

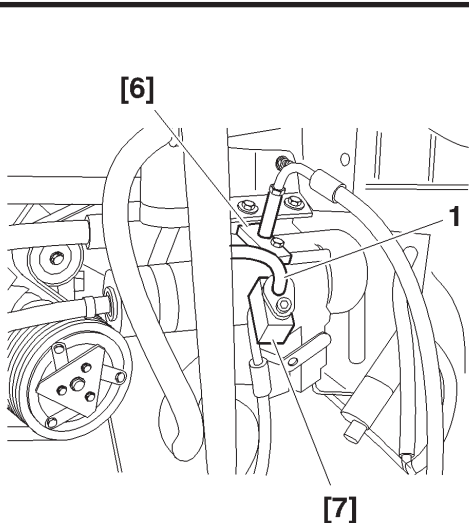
### Using the tools.

- Prepare the checking assembly [1], [2], [3], [4], [5], [6] and [7].
- Attach the tool [1].
- Remove the front RH wheel, the splash-shield and the screen wash reservoir.



B3EP16DC

## CHECKING THE POWER STEERING ASSISTANCE PRESSURE



B3EP16EC

### Preliminary operations.

Move aside the high pressure pipe (1).

Do up:

- The union [6] on the power steering electropump.
- The union [7] on the high pressure pipe (1).
- Tighten all the unions.
- Fill the power steering reservoir **10 mm** above the max. level.

**IMPERATIVE:** Use new power steering fluid for both filling and topping-up the circuit.

Open the tap [5].

Start the engine and allow it to run for **5 seconds**.

Stop the engine.

Move the steering several times in each direction.

Check the steering fluid level and make sure that there are no leaks.

### Checking the electropump pressure.

Start the engine.

Close the tap [5] for **5 seconds**.

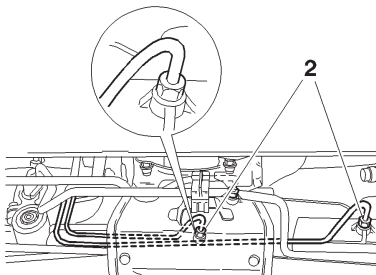
Open the tap [5].

Stop the engine.

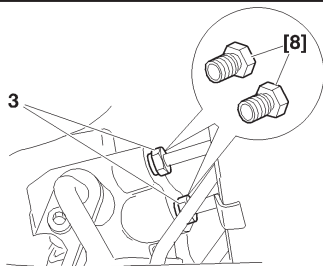
At accelerated idle (*1200 to 1500 rpm*), the pressure should be **105 ± 5 bars**.

If the electropump pressure is correct, check the valve sealing.

## CHECKING THE POWER STEERING ASSISTANCE PRESSURE



B3EP16FC



B3EP16GC

### Checking the valve sealing.

Remove the under-engine shield.

Move aside the heat shield from the steering mechanism.

Slacken the unions **(2)** on the power steering ram.

Uncouple the two supply pipes **(3)** from the distributor valve, and move them aside.

Fit on the distributor valve the two plugs **[8]**, tighten to **0,8 m.daN**.

Move the steering slowly from lock to lock, to drain the ram.

Top up the level of the power steering fluid.

Open the tap **[5]**.

Stop the engine.

Maintain the engine speed at accelerated idle.

Hold the wheels on full lock, first on one side then on the other.

The pressure should adjust to **105 ± 5 bars**.

The pressure is correct: replace the steering mechanism.

The pressure is lower than the values above: replace the distributor valve.

Couple the two supply pipes **(3)** on the distributor valve; tighten to **0,8 m.daN**.

Retighten the unions **(2)** on the power steering ram; tighten to **0,8 m.daN**.

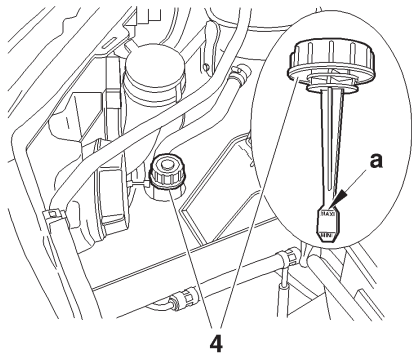
Remove the union **[7]** on the high pressure pipe **(1)** and the union **[6]** on the power steering electropump.

Refit:

- the high pressure pipe **(1)**; tighten to **2 ± 0,2 m.daN**.

- the screen wash reservoir, the front RH splash-shield and the front RH wheel.

## CHECKING THE POWER STEERING ASSISTANCE PRESSURE



Fill the power steering reservoir to the max. mark «a» on the cap **(4)**.

Engine stopped, move the steering slowly from lock to lock, in both directions approx. **ten times**.

Top up the fluid to the max. mark «a» on the cap **(4)**.

Run the engine at idle for **3 minutes**, without any action on the steering wheel.

Move the steering from lock to lock, until there is no longer any tight spot.

Top up the level if it again goes down.

Bleed the circuit by moving the steering several times in each direction.

Top up the level if it again goes down.

**IMPERATIVE:** Use new power steering fluid for both filling and topping-up the circuit.

B3EP16HC

## BRAKE SPECIFICATIONS

				With ABS			
				1.4i 16V	1.6i 16V	1.6 16V HDi	1.6i 16V
				Manual			Auto.
Engine type				KFU	NFU	9HX	NFU
FR	Ø mm	Master cylinder		22,2 (in valve) (1)			
		Amplifier		22,86/BOSCH/EVA2 (2)		25,4/ BOSCH/MCT8 (2)	
		Supplier /pistons		BOSCH/ZOH 54/22			BOSCH/ZOH 54/26
		Disc	Ventilated	266			283
	Disc thickness/ min.			22/20			26/24
	Brake pad grade			FEDERAL MODUL/F769			GALFER/G4554
RR	Ø mm	Cylinder or caliper		BOSCH/TRW C38			
		Disc	Plain	249			
	Disc thickness/ min.			9/7			
	Brake pad grade			GALFER/G4554			

(1) AFU system (EBA) = Emergency Brake Assist (*incorporated as standard*).

(2) AFD system = Automatic lighting of hazard warning lamps on emergency braking (*incorporated as standard*).

#### **Brake fluid reservoir.**

Supplier: **BOSCH**, brake fluid quality: **DOT 4**.

The brake fluid reservoir is in 2 parts: the principal reservoir (*equipped with a level detector*) and a separate reservoir, they are linked by a rislan pipe by means of a clickfit union.



## BRAKE SPECIFICATIONS

				With ESP								
				1.4i 16V	1.6i 16V	2.0i		2.0i 16V	1.6HDi 16V		2.0HDi 16V	
				Manual - Auto.								
Engine type				KFU	NFU	RFJ	RFN	RFK	9HX	9HY	9HZ	RHR
FR	Ø mm	Master cylinder		23,8 (in click) (1)								
		Amplifier		25,4/ BOSCH/MCT8 (2)								
		Supplier/pistons		BOSCH/ZOH 54/26			TEVES/F N3 57/26	BOSCH/ZOH 54/26			TEVES/F N3 57/26	
		Disc	Ventilated	283			302	283			302	
	Disc thickness/ min.		26/24									
	Brake pad grade		GALFER/G4554			JURID 976	GALFER/G4554			JURID 976		
RR	Ø mm	Cylinder or caliper		BOSCH/TRW C38								
		Disc	Plain	249								
	Disc thickness/ min.		9/7									
	Brake pad grade		GALFER/G4554									

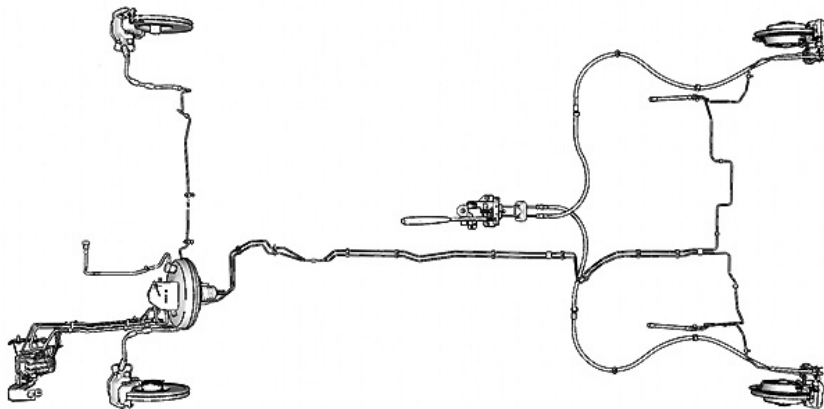
(1) AFU system (EBA) = Emergency Brake Assist (*incorporated as standard*).

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## BRAKE SPECIFICATIONS



### Braking system.

Braking circuit in the form of an **X**.

Disc brakes at the front and at the rear  
(*vehicles all types*):

- The front brake discs are ventilated.
- The rear brake discs are plain.

**NOTE:** The front brake pads have no wear warning lamp.

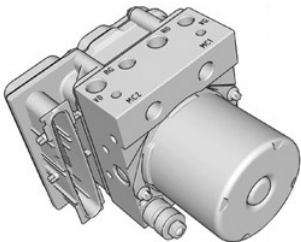
Handbrake lever controlled by cables acting on the rear wheels.

The compensator and main brake limiter functions are assured by the **ABS REF** systems.

**NOTE:** REF = Electronic Brakeforce Distribution (EBD).

B3FP7E1D

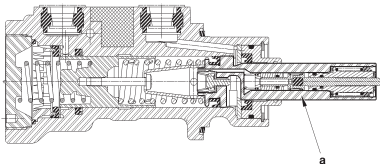
## BRAKE SPECIFICATIONS



B3FP7E3C

## ABS/ESP hydraulic block

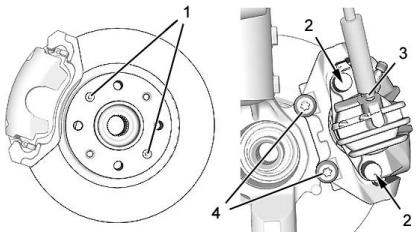
Components	Supplier	Type	Observations
Hydraulic block	BOSCH	ABS REF 8.0	Installed under the front LH chassis member. 4 regulation channels.
		ESP 8.0	



B3FP7E2D

The emergency braking control is incorporated in the primary piston at «a».

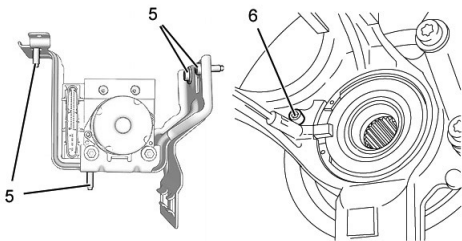
## TIGHTENING TORQUES: BRAKING SYSTEM



B3FP7DVD

## Front brakes

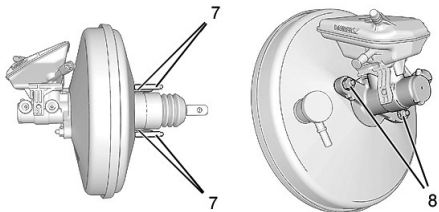
1	Front brake disc	$1 \pm 0,1$
2	Yoke on caliper	$3 \pm 0,3$
3	Unions on brake piping	$1,5 \pm 0,1$
4	Caliper on pivot	$10,5 \pm 1$



B3FP7DWD

5	ABS/ESP hydraulic block support on the chassis member	$0,2 \pm 0,1$
6	Wheel sensor	$0,8 \pm 0,1$

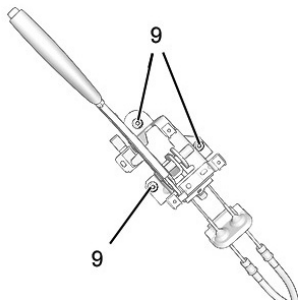
## TIGHTENING TORQUES: BRAKING SYSTEM



B3FP7DXD

## Front brakes

7	Braking amplifier	$2,2 \pm 0,3$
8	Master cylinder on braking amplifier	$2 \pm 0,5$

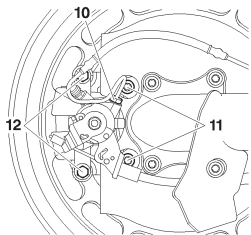


B3FP7DYC

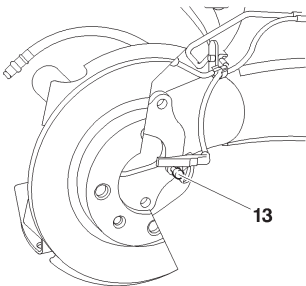
## Handbrake

9	Handbrake lever	$1,5 \pm 0,2$
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## TIGHTENING TORQUES: BRAKING SYSTEM



B3FP7DZC



B3FP7EOC

## Rear brakes

10	Unions on brake piping	$1,5 \pm 0,1$
11	Rear brake caliper support	$5,3 \pm 0,5$
12	Rear brake caliper	$3 \pm 0,3$
13	Wheel sensor	$0,8 \pm 0,1$

## VALUES FOR CHECKING AND ADJUSTING THE BRAKING SYSTEM

Front brake					
Engines		KFU - NFU (Manual) 9HX	NFU (Auto.)	KFU - NFU (Manual - Auto.) RFJ - RFN 9HX - 9HY - 9HZ	RFK RHR
		With ABS		With ESP	
Front brake disc	Diameter (mm)	266	283		302
	Thickness (mm)	22	26		
	Minimum thickness (mm)	20	24		
	Difference in maximum thickness on the same circumference (mm)	0,01			
	Maximum run-out (mm)	0,05			
Front brake pads	Thickness (mm)	13			
	Minimum thickness (mm)	4			

## VALUES FOR CHECKING AND ADJUSTING THE BRAKING SYSTEM

## Rear brake

Engines		KFU - NFU- RFJ - RFN - RFK - 9HX - 9HY - 9HZ - RHR											
Rear brake disc	Diameter (mm)	249											
	Thickness (mm)	9											
	Minimum thickness (mm)	7											
	Difference in maximum thickness on the same circumference (mm)	0,01											
	Maximum run-out (mm)	0,05											
Rear brake pads	Thickness (mm)	11											
	Minimum thickness (mm)	3											
<table><tr><th colspan="3">Vacuum pump pressure</th></tr><tr><th>Engine oil temperature</th><th>Minimum vacuum</th><th>Maximum time (in seconds) to attain the minimum vacuum</th></tr><tr><td rowspan="2">80°C ± 5°C</td><td>500 mbars</td><td>4,5 seconds</td></tr><tr><td>800 mbars</td><td>18 seconds</td></tr></table>			Vacuum pump pressure			Engine oil temperature	Minimum vacuum	Maximum time (in seconds) to attain the minimum vacuum	80°C ± 5°C	500 mbars	4,5 seconds	800 mbars	18 seconds
Vacuum pump pressure													
Engine oil temperature	Minimum vacuum	Maximum time (in seconds) to attain the minimum vacuum											
80°C ± 5°C	500 mbars	4,5 seconds											
	800 mbars	18 seconds											



## HANDBRAKE ADJUSTMENT

### Adjustment.

**IMPERATIVE:** Respect the safety and cleanliness requirements.

Raise and support the vehicle.

Remove the central console.

**WARNING:** Check the routing of the brake cables under the vehicle.

Release the handbrake lever.

Press gently on the brake pedal (*then repeat the operation 3 times*).

Action the handbrake lever **8 times** with a force of **40 daN**.

Use a feeler gauge at «J» to measure the movement of the lever in relation to its stop.

**NOTE:** The movement should be less than **1,5 mm** and more than **0,05 mm**.

**(1)** Nut for adjusting the tension of the handbrake cables.

Move the nut **(1)** to obtain a movement «J» less than or equal to **1,5 mm**.

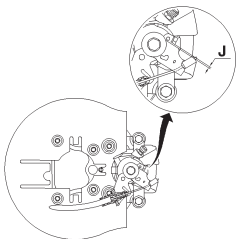
Action the handbrake lever **8 times** with a force of **40 daN**.

With the handbrake released, check the movement «j» with a feeler gauge.

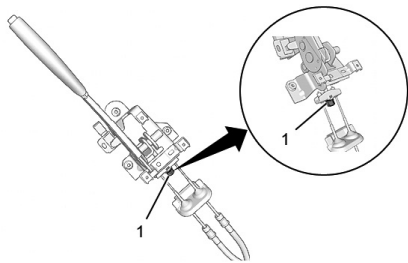
**NOTE:** The movement should be less than **1,5 mm** and more than **0,05 mm**.

Refit the central console (*see corresponding operation*).

Check the efficiency of the handbrake.

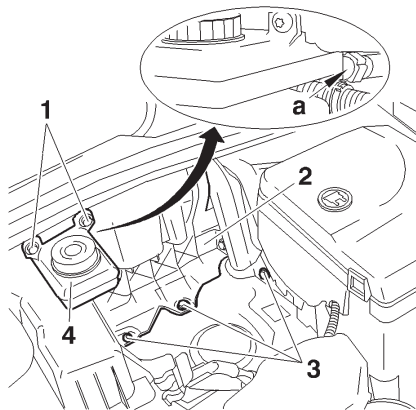


B3FP7F1C



B3FP7F2D

## BLEEDING AND FILLING THE BRAKING SYSTEM



### Tools.

- [1] Bleeding apparatus
- [2] LEXIA diagnostic tool
- [3] PROXIA diagnostic tool

- : «LURO» or similar
- : 4171-T
- : 4165-T

**NOTE:** Bleeding of the secondary braking circuit is done with the aid of diagnostic tools [2] and [3].

### Draining of the brake fluid reservoir.

Remove the screws (3) and the battery tray (2).

Remove the filter of the brake fluid reservoir (4).

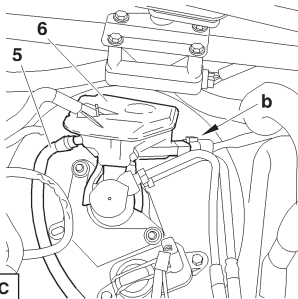
Drain the brake fluid reservoir (4) to the maximum extent (*if necessary, use a clean syringe*).

Remove the screws (1).

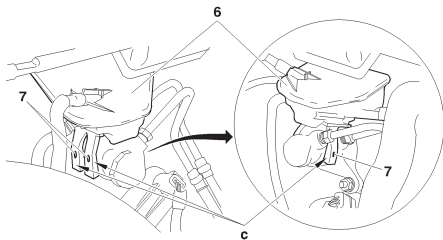
Uncouple the clickfit union at «a».

Remove the brake fluid reservoir (4).

## BLEEDING AND FILLING THE BRAKING SYSTEM



B3FP7ERC



B3FP7ESD

Disconnect the connector «b».

Uncouple the pipe (5).

Remove the reservoir (6), moving aside the tabs «c» of the pins (7).

Clean the brake fluid reservoir (4) and the brake fluid reservoir (6).

Refit the brake fluid reservoir (6).

Couple the pipe (5).

Reconnect the connector «b».

Couple the clickfit union, at «a».

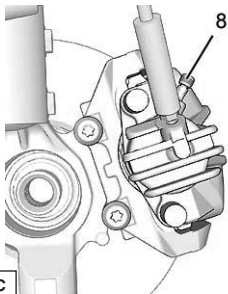
Refit:

- The brake fluid reservoir (4).
- The screws (1).
- The filter of the brake fluid reservoir.
- The battery tray.
- The screws (3).
- The battery.

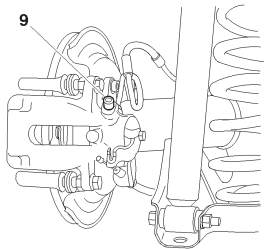
Reconnect the battery.

**IMPERATIVE:** Carry out the operations that are necessary following a reconnection of the battery (*see corresponding operation*).

## BLEEDING AND FILLING THE BRAKING SYSTEM



B3FP7ETC



B3FP7EUC

### Filling the braking circuit.

**WARNING:** Use only the approved and recommended hydraulic fluids.

**IMPERATIVE:** Only use new brake fluid that has not emulsified; avoid any introduction of impurities into the hydraulic circuit.

Fill the brake fluid reservoir (4).

### Bleeding the primary braking circuit.

**WARNING:** During the bleed operations: take care to maintain the level of the brake fluid in the reservoir, keep it topped up.

**WARNING:** The **ABS** system must not be in action during the bleed operation.

**WARNING:** Respect the sequence for the opening of the bleed screws.

Front brake caliper : Bleed screw (8).

Rear brake caliper : Bleed screw (9).

Bleed each brake caliper, proceeding in the following sequence:

- Front LH wheel.
- Front RH wheel.
- Rear LH wheel.
- Rear RH wheel.

## BLEEDING AND FILLING THE BRAKING SYSTEM

### Bleeding the braking circuit with the bleed apparatus.

Connect the bleed apparatus [1] on the brake fluid reservoir (4).

Adjust the apparatus pressure to **2 Bars**.

For each brake circuit:

- Couple a transparent tube on the bleed screw.
- Submerge the other end of the tube in a clean container.
- Open the bleed screw.
- Wait until the brake fluid flows out without air bubbles.
- Close the bleed screw.
- Remove the bleed apparatus [1].

Check the level of the brake fluid (*between the «**DANGER**» level and the «**MAXI**» level*).

Fill if necessary with the the approved and recommended synthetic brake fluid.

## BLEEDING AND FILLING THE BRAKING SYSTEM

### Bleeding the braking circuit without the bleed apparatus.

**NOTE:** Two operators are necessary.

For each brake circuit:

- Apply the brake pedal to place the circuit under pressure.
- Couple a transparent tube on the bleed screw.
- Submerge the other end of the tube in a clean container.
- Open the bleed screw.
- Wait until the fluid flows out without air bubbles.
- Close the bleed screw.

**NOTE:** Recommence the process a second time if that is necessary.

Check the level of the brake fluid (*between the «**DANGER**» level and the «**MAXI**» level*).

Fill if necessary with the the approved and recommended synthetic brake fluid.

### Bleeding the secondary braking circuit.

**WARNING:** During the bleed operations: take care to maintain the level of the brake fluid in the reservoir, keep it topped up.

**NOTE:** The bleed apparatus [1] is still connected on the brake fluid reservoir (4).

Use the diagnostic tools [2] or [3].

Select the menu corresponding to the vehicle:

- **ABS menu** (*according to equipment*).
- **ESP menu** (*according to equipment*).

Follow the instructions of the diagnostic tool.

At the end of the bleed programme, check the level of the brake fluid, top up if necessary.

Check the travel of the brake pedal: it must not be excessive. If it is, restart the bleed procedure.

STARTER MOTORS					
Engine	Gearbox	Engine type	Supplier	Class	Climate
1.4i 16V	BVM	KFU	-	2	C
					T
				3	F
					GF
1.6i 16V	BVM	NFU	-	3	C
	BVA				T
					F
					GF
2.0i 16V	BVM	RFN	VALEO BOSCH MELCO	3	C
				4	T
					F
					GF
2.0i	BVA	RFJ	VALEO BOSCH MELCO	3	C
				4	T
					F
					GF
2.0i 16V	BVM	RFK	VALEO BOSCH MELCO	3	C
				4	T
					F
					GF
GEARBOX: BVM (Manual), BVA (Automatic).					
CLIMATE: T (Temperate), C (Hot), F (Cold), GF (Very cold).					

## STARTER MOTORS

Engine	Gearbox	Engine type	Supplier	Class	Climate
1.6 HDi 16V	BVM	9HX	VALEO	4	C
					T
				6	F
					GF
	BVM	9HY	VALEO	5	C
					T
				6	F
					GF
	BVM	9HZ	VALEO	5	C
					T
				6	F
					GF
2.0 HDi 16V	BVM	RHR	VALEO	5	C
					T
				6+	F
					GF

**GEARBOX:** BVM (Manual), BVA (Automatic).

**CLIMATE:** T (Temperate), C (Hot), F (Cold), GF (Very cold).



## ALTERNATORS

Without air conditioning

Engine	Gearbox	Engine type	Base	HiFi	Heated seat	Heated seat + HiFi	Climate
1.4i 16V	BVM	KFU	8+				C
							T
			12				F
							GF
1.6 HDi 16V	BVM	NFU	8+				C
							T
			12				F
							GF
	BVA		8+				C
							T
			8+			12	F
			12				GF

GEARBOX: **BVM** (Manual), **BVA** (Automatic).CLIMATE: **T** (Temperate), **C** (Hot), **F** (Cold), **GF** (Very cold).

## ALTERNATORS

Without air conditioning

Engine	Gearbox	Engine type	Base	HiFi	Heated seat	Heated seat + HiFi	Climate
2.0i 16V	BVM	RFN	8+	12	8+	8+	C
						12	T
							F
							GF
2.0i	BVA	RFJ	12				C
							T
							F
							GF
2.0i 16V	BVM	RFK	15				C
							T
							F
							GF

**GEARBOX:** BVM (Manual), BVA (Automatic).

**CLIMATE:** T (Temperate), C (Hot), F (Cold), GF (Very cold).

ELECTRICALS

## ALTERNATORS

With air conditioning

Engine	Gearbox	Engine type	Base	HiFi	Heated seat	Heated seat + HiFi	Climate
1.4i 16V	BVM	KFU	12				C
							T
			8+				F
			12				GF
1.6i 16V	BVM	NFU	12				C
			8+	12	8+	12	T
				8+		8+	F
			12				GF
	BVA		12				C
							T
			8+			12	F
			12				GF

GEARBOX: **BVM** (Manual), **BVA** (Automatic).CLIMATE: **T** (Temperate), **C** (Hot), **F** (Cold), **GF** (Very cold).

## ALTERNATORS

With air conditioning

Engine	Gearbox	Engine type	Base	HiFi	Heated seat	Heated seat + HiFi	Climate
2.0i 16V	BVM	RFN	12				C
							T
			8+	12	8+	12	F
			12		12		GF
2.0i	BVA	RFJ	15				C
			12				T
							F
			12			15	GF
2.0i 16V	BVM	RFK	15				C
							T
							F
							GF

**GEARBOX:** BVM (Manual), BVA (Automatic).

**CLIMATE:** T (Temperate), C (Hot), F (Cold), GF (Very cold).

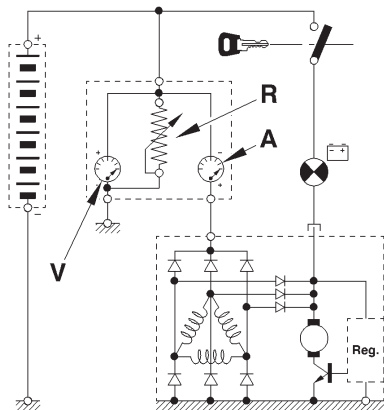
ELECTRICALS

ALTERNATORS							
With or without air conditioning							
Engine	Gearbox	Engine type	Base	HiFi	Heated seat	Heated seat + HiFi	Climate
1.6 HDi 16V	BVM	9HX	15				C
							T
							F
							GF
2.0 HDi 16V		9HY 9HZ					C
							T
							F
							GF
	RHR	C					
		T					
		F					
		GF					
GEARBOX: BVM (Manual), BVA (Automatic). CLIMATE: T (Temperate), C (Hot), F (Cold), GF (Very cold).							

## PRE-HEATING AND STARTING SYSTEM

Vehicles - models			Pre-heater plugs	Tightening torque (m.daN)	Pre-heater control unit	Tightening torque (m.daN)	Pre / Post heating (pre-heating duration at 20°C)
C4	1.6 HDi 16V	9HX	NGK YE04 BERU	0,85 ± 0,08	NAGARES BDL/7-12 CARTIER DV4HSS	0,25 ± 0,02	Controlled by the diesel injection ECU
		9HY					
		9HZ					
	2.0 HDi 16V	RHR	BOSCH GSK2 BERU	1 ± 0,1		0,4 ± 0,1	

## CHARGING CIRCUIT - ALTERNATOR WITH MONO-FUNCTION REGULATOR



D1APO1SC

### Checking the alternator output.

Connect as shown in the diagram opposite, using an ammeter (**A**), a voltmeter (**V**), and a rheostat (**R**) or a **Volt/Ammeter/Rheostat** combination.

Referring to the vehicle's equipment specification (*see table opposite*), adjust the engine speed and rheostat charge to obtain **U = 13.5 V**.

**Reminder:** The excitation energising current will flow through the warning lamp; check that the warning lamp comes on when the ignition is switched on. It should go out when the engine has started (*accelerate slightly*).

### Checking the voltage regulator.

Set the rheostat to zero and disconnect all the electrical consumers.

With display **5000 rpm** and alternator **U > 14.7 V**, the regulator is faulty.

**Note:** These tests should be performed with the engine hot and the battery fully charged.

### Output less than 13.5 V Current (A) / Alternator speed

Speed: Class	2000 rpm	3000 rpm	4000 rpm
5	29 A	39 A	43 A
7	42 A	54 A	59 A
8	49 A	62 A	68 A
9	62 A	76 A	83 A
12	72 A	90 A	100 A
15	99A	128A	140A

## AIR CONDITIONING R 134 a : CAPACITIES

Vehicle	Engines	Date	Refrigerant refill	Compressor		
				Variable Capacity	Oil quantity cc	Oil reference
C4	All types (except RHR)	09/04 →	450 ± 25	SD 7 C 12	135	SP 10
	RHR			SD 6 C 12		

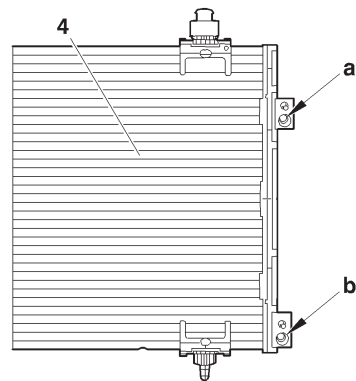


## SPECIAL FEATURES: AIR CONDITIONING SYSTEM

### Compressor

The variable capacity air conditioning compressor has external control.  
The internal pneumatic valve is replaced by an external electrovalve.

### Condenser



The condenser **(4)** has a cylinder incorporating the function of aircon fluid reservoir and with integral filtering cartridge.

**a:** Inlet union

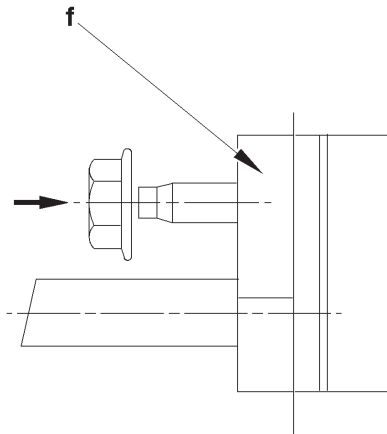
**b:** Outlet union

**NOTE:** The filtering cartridge is not interchangeable.

C5HP1CKC

## SPECIAL FEATURES: AIR CONDITIONING SYSTEM

### Tightening



Requirements for fitting the inlet and outlet brackets:

- Aircon compressor.
- Aircon condenser.
- Aircon pressure reducer valve.

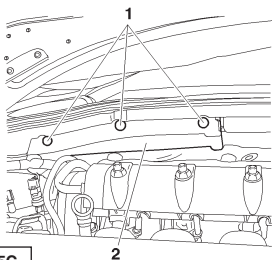
**IMPERATIVE: Assembly requirement: the bracket(s) «f» must be against their interface(s) before the nut(s) are tightened.**

**IMPERATIVE: Respect the tightening torques.**

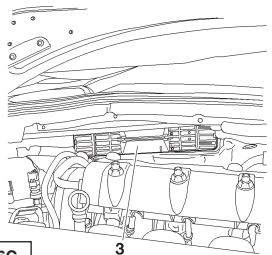
C5HP1CWC

## SPECIAL FEATURES: AIR CONDITIONING SYSTEM (R 134.a)

### Pollen filter



C5HP1C5C



C5HP1C6C

**Note:** The pollen filter is located in the engine compartment on the **RH** side.

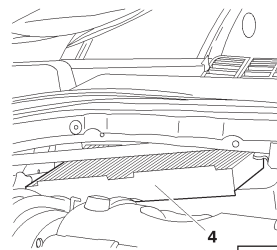
#### Removing.

Remove:

- The plastic pins (1).
- The plastic cover (2).
- The flap (3).
- The pollen filter (4).

#### Refitting.

Proceed in reverse order.



C5HP1C7C

## SPECIAL FEATURES: AIR CONDITIONING SYSTEM (R 134.a)

### Compressor lubricant

**ESSENTIAL:** The compressor lubricant is extremely hygroscopic; always use FRESH oil.

### Checking the compressor oil level

There are three specific cases:

- **1/** Repairs to a system without leaks.
- **2/** Slow leak.
- **3/** Fast leak.

#### **1/ Repairing a system without leaks.**

##### **a) - Using draining/recovery equipment not fitted with an oil decanter.**

- Drain the system as slowly as possible via the **LOW PRESSURE** valve, so as not to lose any oil.
- No more oil should be added when filling the system with **R 134.a fluid**.

##### **b) - Using draining/filling equipment fitted with an oil decanter.**

- Drain the **R 134.a fluid** from the system in accordance with the instructions in the equipment handbook.
- Measure the amount of oil recovered.
- Add the same amount of **NEW oil** when filling the system with **R 134.a fluid**.

##### **c) - Replacing a compressor.**

- Remove the old compressor, drain it and measure the oil quantity.
- Drain the new compressor (*supplied full*), so that the same amount of **NEW oil** is left in the compressor as was in the old compressor.
- No more oil should be added when filling the system with **R 134.a fluid**.

## SPECIAL FEATURES: AIR CONDITIONING SYSTEM (R 134.a)

### Checking the compressor oil level (continued)

#### 2/ Slow leak.

- Slow leaks do not lead to oil loss, therefore the same procedure should be followed as if there was no leak at all.

#### 3/ Fast leak.

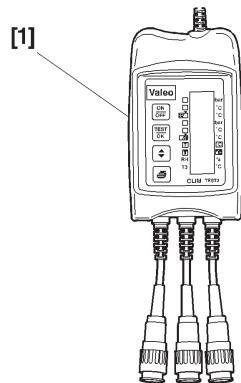
This type of leak causes both oil loss as well as allowing air to enter the system.

It is therefore necessary to:

- Replace the dehydrator.
- Drain as much oil as possible (*when replacing the faulty component*).

Either before or during filling of the system with **R 134.a fluid**, introduce **80 cc** of **NEW oil** into the system.

## CHECKING THE EFFICIENCY OF THE AIR CONDITIONING SYSTEM



### Tools.

[1] Clim test 2 VALEO

: 4372-T

### Checks.

Position the tool [1] *(depending on manufacturer's instructions)*.

## CHECKING THE EFFICIENCY OF THE AIR CONDITIONING SYSTEM

### Management of the air conditioning compressor

#### Air conditioning compressor safety.

The management of the aircon compressor clutch is identical whether with basic air conditioning (**RF**) or with fully automatic air conditioning (**RFTA**).

#### Air conditioning evaporator icing safety.

The **BSI1** prohibits the triggering of the aircon compressor in certain temperature conditions, to avoid the aircon evaporator icing up.

The **BSI1** manages the evaporator icing safety in the following way:

- The aircon compressor is cut if the temperature of the aircon evaporator sensor is lower than **1°C** for **1 minute**.
- The aircon compressor is triggered, after the cut-off timing of one minute, when the temperature of the aircon evaporator sensor returns above **2°C**.

#### Cutting of the aircon compressor caused by the speed of the compressor.

The aircon compressor is cut in the following cases:

- If the aircon compressor speed reaches **8100 rpm** ;
- If the aircon compressor speed exceeds **7500 rpm** for more than **10 seconds**.

#### Air conditioning fluid pressure safety.

The status of the aircon high and low pressure safety is transmitted by a linear pressure sensor via the **BSI1**.

The linear pressure sensor measures the pressure of the aircon fluid.

The engine **ECU** acquires the information on the aircon fluid pressure by wire link.

The aircon compressor is cut if the aircon fluid pressure is lower than **2.8 bars**.

The aircon compressor is triggered when the aircon fluid pressure returns above **3.3 bars**.

The aircon compressor is cut if the aircon fluid pressure is higher than **27 bars**.

The aircon compressor is triggered when the aircon fluid pressure returns below **20 bars**.

## CHECKING THE EFFICIENCY OF THE AIR CONDITIONING SYSTEM

### Management of the air conditioning compressor

#### **Safety as a function of the outside temperature.**

The aircon compressor is cut if the outside temperature is lower than **3.5 °C**.

The aircon compressor is triggered when the outside temperature goes above **5°C**.

#### **Safety as a function of electric diagnosis.**

The cutting of the aircon compressor is effective in the following conditions:

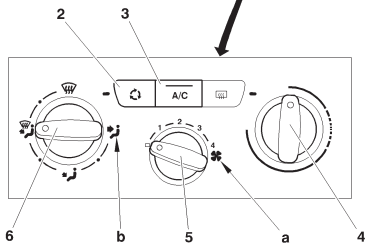
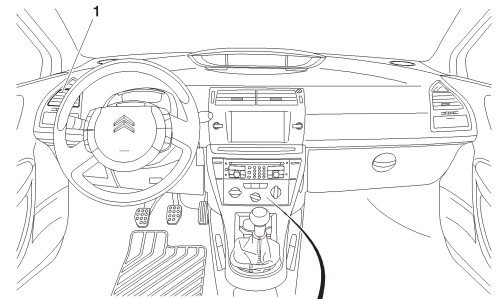
- Fault in the aircon compressor clutch.
- Fault in the aircon compressor electrovanne.
- Fault in the aircon fluid pressure sensor.
- Fault in the blower (*delay of 30 seconds*).
- Fault in communication between the engine ECU and the BSI1.
- Fault in communication between the engine relay unit (BSM) and the BSI1.

**NOTE:** see procedure «**Principle of operation: air conditioning**».



## CHECKING THE EFFICIENCY OF THE AIR CONDITIONING SYSTEM

### Manual air conditioning



#### Checking.

Position the tool [1] (*depending on manufacturer's instructions*).

#### Preliminary operations.

Close all the front air vents.

Start the engine. Open the front **LH air vent (1)**.

Position the air distribution control **(6)** to **frontal flow** at «**b**».

Activate the **air recirculation** control by pressing on the switch **(2)** (*lamp comes on*).

Activate the **air conditioning** control by pressing on the switch **(3)** (*lamp comes on*).

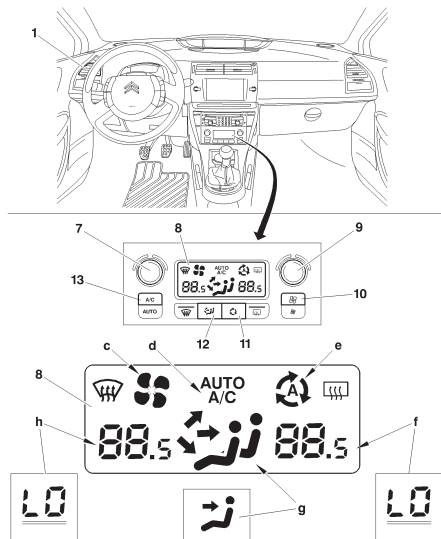
Positions of the air conditioning controls:

- Temperature control **(4)** on maximum cold.
- Blower control **(5)** in maximum speed position at «**a**».

Let the air conditioning operate for **5 minutes**.

## CHECKING THE EFFICIENCY OF THE AIR CONDITIONING SYSTEM

### Automatic bi-zone air conditioning



C5FP0NYP

#### Checking.

Position the tool [1] (*depending on manufacturer's instructions*).

#### Preliminary operations.

Close all the front air vents.

Start the engine.

Open the front **LH** air vent (1).

#### Operating the air distribution function.

Press on the switch (12).

Select the central and side air vents «g».

The display at «g» appears on the screen (8).

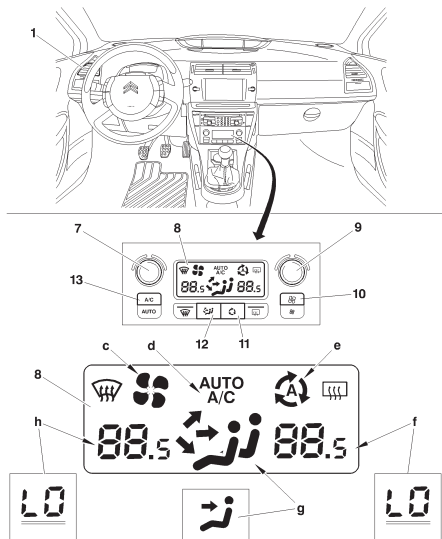
#### Operating the air recirculation function.

Press on the switch (11).

The display at «e» appears on the screen (8).

## CHECKING THE EFFICIENCY OF THE AIR CONDITIONING SYSTEM

### Automatic bi-zone air conditioning



#### Operating the air conditioning function.

Press on the switch **(13)**.

The display at «**d**» appears on the screen **(8)**.

#### Operating the air flow function.

Press on the switch **(10)** to increase the air flow to the maximum.

The level of air flow is indicated on the display **(8)** at «**c**» by the progressive filling-in of the ventilator blades.

#### Operating the LH/RH cabin temperature function.

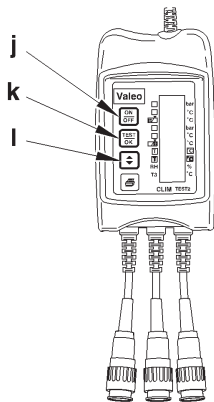
Turn the controls **(7)** and **(9)** to the left to set the temperature as low as possible.

The display **LO (Low)** appears on the screen **(8)** at «**h**» and «**f**».

Let the air conditioning operate for **5 minutes**.

C5FP0NYP

## CHECKING THE EFFICIENCY OF THE AIR CONDITIONING SYSTEM



**Setting the checking tool [1] to measurement mode.**

Operate the checking tool, press on button "j".

**Select the type of aircon fluid: R134.a or R12:**

- Press on button "l", validate by pressing on button "k".

**Select the type of aircon fluid: with filtering and drying cartridge, or calibrated aperture:**

- Press on button "l", validate by pressing on button "k".

**Select the temperature setting T3,**

- Press on button "l", validate by pressing on button "j".

**NOTE:** The tool is in measurement mode.

**Aircon compressor with fixed capacity:**

- Take the measurement with the engine running, at idle.

**Aircon compressor with variable capacity:**

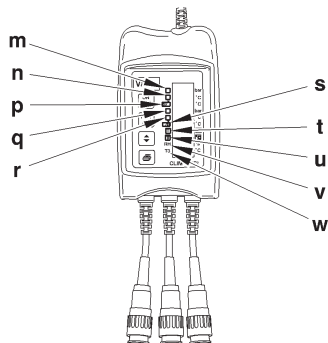
- Take the measurement with the engine running, at 1500 rpm.

**Setting the checking tool to diagnostic mode.**

Set the checking tool to diagnostic mode, press on button "j".

The diagnosis is performed instantaneously: values outside the tolerances are displayed on a dark background.

## CHECKING THE EFFICIENCY OF THE AIR CONDITIONING SYSTEM



### Interpretation of the measurements

«m»: High pressure.  
«n»: High temperature.  
«p»: Under-cooling (SR).  
«q»: Low pressure.  
«r»: Low temperature.

«s»: Over-heating (SC).  
«t»: Ambient air temperature.  
«u»: Blown air temperature.  
«v»: Humidity.  
«w»: Temperature T3.

### Over-heating (SC).

The over-heating represents the difference between the aircon fluid temperature at the evaporator outlet and the evaporation temperature.

The over-heating gives the quantity of aircon fluid (*in the liquid state*) in the air conditioning circuit

### Values for over-heating (SC)

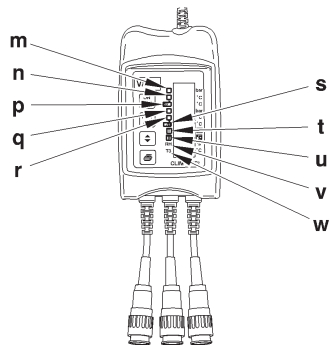
Values «p»	Origins	Solutions
SR < 2°C	Lack of aircon fluid in the aircon condenser ( <i>should be more than 150 grammes</i> )	Add aircon fluid
2°C < SR < 4°C	Lack of aircon fluid in the aircon condenser ( <i>should be around 100 to 150 grammes</i> )	
4°C < SR < 10°C/12°C	Correct quantity	
SR > 10°C/12°C	Excess aircon fluid in the aircon condenser	Remove aircon fluid
SR > 15°C		

### Blown air temperature «u».

The blown air temperature should be between 2°C and 10°C.

E5AP2FBC

## CHECKING THE EFFICIENCY OF THE AIR CONDITIONING SYSTEM



### Interpretation of the measurements.

«m»: High pressure.

«n»: High temperature.

«p»: Under-cooling (SR).

«q»: Low pressure.

«r»: Low temperature.

«s»: Over-heating (SC).

«t»: Ambient air temperature.

«u»: Blown air temperature.

«v»: Humidity.

«w»: Temperature T3.

### Over-heating (SC).

The over-heating represents the difference between the aircon fluid temperature at the evaporator outlet and the evaporation temperature.

The over-heating gives the quantity of aircon fluid (*in the liquid state*) in the air conditioning circuit.

### Values for over-heating (SC)

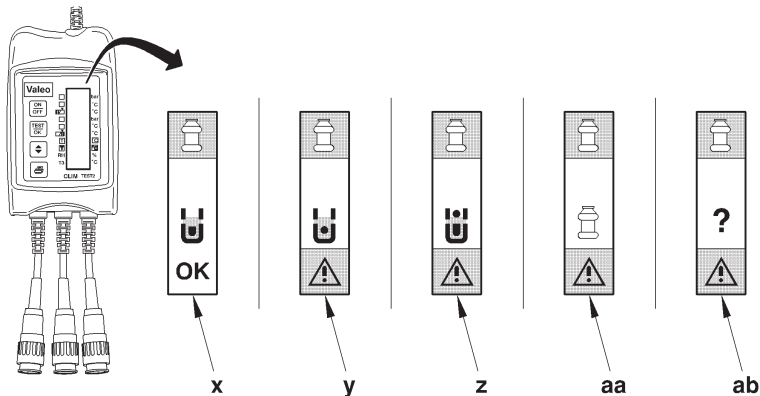
Values «s»	Origins	Solutions
$2^{\circ} < SC < 15^{\circ}C$	Correct quantity	
$SC > 15^{\circ}C$	Lack of aircon fluid in the cooling circuit	Add aircon fluid
$SC < 2^{\circ}C$	Excess aircon fluid in the cooling circuit	Remove aircon fluid

### Blown air temperature «u».

The blown air temperature should be between  $2^{\circ}C$  and  $10^{\circ}C$ .

## CHECKING THE EFFICIENCY OF THE AIR CONDITIONING SYSTEM

### Interpretation of the diagnosis



E5AP2FCD

- «x» Check correct.
- «y» Lack of aircon fluid in the aircon circuit.
- «z» Excess aircon fluid in the aircon circuit.
- «aa» Filtering and drying cartridge clogged.
- «ab» Other problems (*see table above*).

## CHECKING THE EFFICIENCY OF THE AIR CONDITIONING SYSTEM

**Aircon circuit diagnosis table**

Principal problem	Symptom	Possible causes
The aircon compressor does not turn, or stops suddenly	The clutch of the aircon compressor does not engage, or disengages suddenly	Aircon compressor clutch
		Lack of aircon fluid in the aircon circuit
		Aircon pressostat
		Aircon evaporator sensor
		Electrical circuit (wiring, fuses, etc.)
	The clutch of the aircon compressor remains engaged and stops suddenly	Auxiliaries drive belt
		Aircon compressor
		Filtering and drying cartridge
		Aircon pressure reducer
		Leak of aircon fluid
		Aircon compressor clutch



## CHECKING THE EFFICIENCY OF THE AIR CONDITIONING SYSTEM

Aircon circuit diagnosis table

Principal problem	Symptom	Possible causes
The aircon compressor makes an abnormal noise	The clutch of the aircon compressor remains engaged	Incorrect adjustment of the aircon compressor clutch
		Aircon fluid quantity
		Aircon compressor defective
		Lack of aircon fluid in the aircon circuit
	The clutch of the aircon compressor remains engaged and slips	Aircon compressor valves defective
		Aircon compressor clutch
		Auxiliaries drive belt

## CHECKING THE EFFICIENCY OF THE AIR CONDITIONING SYSTEM

**Aircon circuit diagnosis table**

Principal problem	Symptom	Possible causes
Abnormal levels of pressure	Low pressure and high pressure too high	Aircon pressure reducer defective
		Duct clogged
	Low pressure too high and high pressure too low	Aircon compressor seal defective
	Low pressure too low and high pressure too high	Aircon evaporator sensor defective
		Aircon pressure reducer jammed
		Filtering and drying cartridge obstructed
		Duct clogged
	Low pressure and high pressure too low	Duct clogged
		Aircon pressure reducer jammed
		Lack of aircon fluid in the aircon circuit
		Aircon compressor defective

## CHECKING THE EFFICIENCY OF THE AIR CONDITIONING SYSTEM

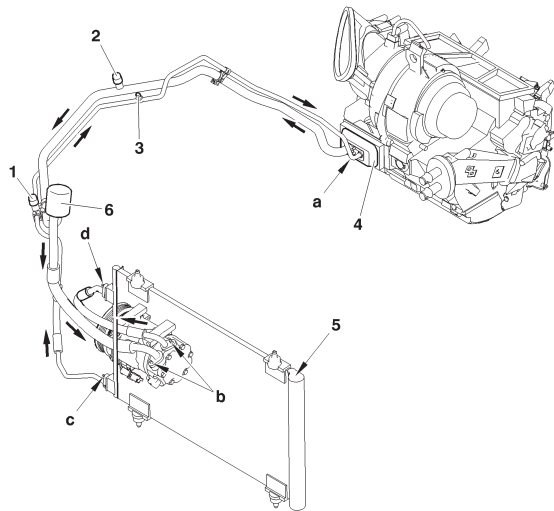
**Aircon circuit diagnosis table**

Principal problem	Symptom	Possible causes
Abnormal levels of pressure	Low pressure normal and high pressure too high	Presence of air in the aircon circuit
	Low pressure normal and high pressure too low	Aircon pressostat defective
		Evaporator sensor defective
	Low pressure too high and high pressure normal	Aircon pressure reducer jammed open
	Low pressure too low and high pressure normal	Filtering and drying cartridge saturated or clogged
		Aircon pressure reducer iced up
Air conditioning operating in back-up mode	Under cooling too weak	Lack of aircon fluid
	Under cooling excessive	Excess aircon fluid
		Presence of air in the aircon circuit
		Filtering and drying cartridge clogged

**NOTE:** In all cases, measure the excessive heating (SC) and the blown air temperature.

## AIR CONDITIONING SYSTEM R 134.a

Engines: KFU - NFU



(1) High pressure valve

(2) Low pressure valve

(3) Pressostat (*tighten to 0,6 m.daN*)

(4) Aircon pressure reducer

(5) Filtering and drying cartridge

(6) Buffer capacity

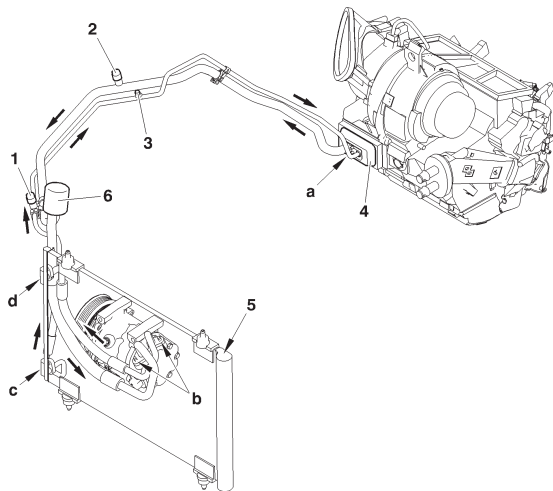
«a» Outlet and inlet of the aircon pressure reducer, tighten to **0,8 m.daN**

«b» Outlet and inlet of the aircon compressor, tighten to **0,7 m.daN**

«c» and «d» Outlet and inlet of the aircon condenser, tighten to **0,6 m.daN**

## AIR CONDITIONING SYSTEM R 134.a

Engine: RFN



(1) High pressure valve

(2) Low pressure valve

(3) Pressostat (*tighten to 0,6 m.daN*)

(4) Aircon pressure reducer

(5) Filtering and drying cartridge

(6) Buffer capacity

«a» Outlet and inlet of the aircon pressure reducer, tighten to **0,8 m.daN**

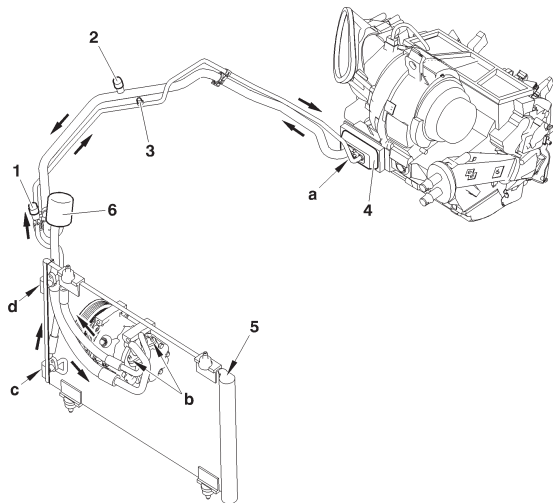
«b» Outlet and inlet of the aircon compressor, tighten to **0,7 m.daN**

«c» and «d» Outlet and inlet of the aircon condenser, tighten to **0,6 m.daN**

C5HP1BMP

## AIR CONDITIONING SYSTEM R 134.a

Engines: RFJ - RFK

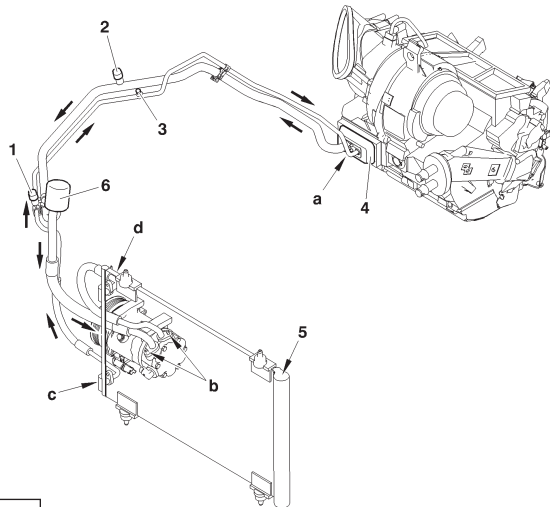


- (1) High pressure valve
- (2) Low pressure valve
- (3) Pressostat (*tighten to 0,6 m.daN*)
- (4) Aircon pressure reducer
- (5) Filtering and drying cartridge
- (6) Buffer capacity

«a» Outlet and inlet of the aircon pressure reducer, tighten to **0,8 m.daN**  
«b» Outlet and inlet of the aircon compressor, tighten to **0,7 m.daN**  
«c» and «d» Outlet and inlet of the aircon condenser, tighten to **0,6 m.daN**

## AIR CONDITIONING SYSTEM R 134.a

Engines: 9HX - 9HY - 9HZ



(1) High pressure valve

(2) Low pressure valve

(3) Pressostat (*tighten to 0,6 m.daN*)

(4) Aircon pressure reducer

(5) Filtering and drying cartridge

(6) Buffer capacity

«a» Outlet and inlet of the aircon pressure reducer, tighten to **0,8 m.daN**

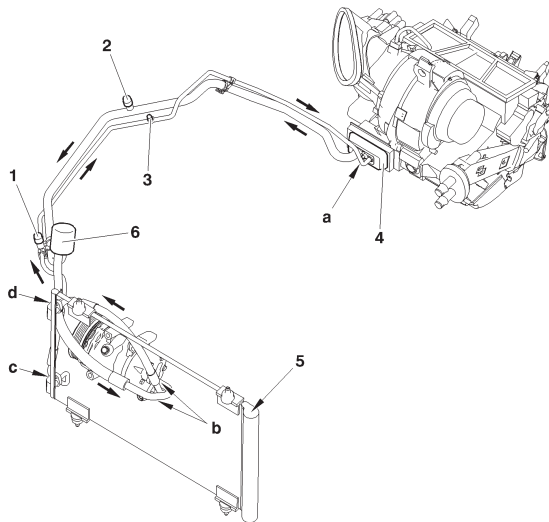
«b» Outlet and inlet of the aircon compressor, tighten to **0,7 m.daN**

«c» and «d» Outlet and inlet of the aircon condenser, tighten to **0,6 m.daN**

C5HP1BNP

## AIR CONDITIONING SYSTEM R 134.a

Engine: RHR



(1) High pressure valve

(2) Low pressure valve

(3) Pressostat (*tighten to 0,6 m.daN*)

(4) Aircon pressure reducer

(5) Filtering and drying cartridge

(6) Buffer capacity

«a» Outlet and inlet of the aircon pressure reducer, tighten to **0,8 m.daN**

«b» Outlet and inlet of the aircon compressor, tighten to **0,7 m.daN**

«c» and «d» Outlet and inlet of the aircon condenser, tighten to **0,6 m.daN**

C5HP1BJP